

Form 1680

**HANDBOOK OF THE**  
**5-INCH AND 6-INCH GUN CARRIAGES, MODEL OF 1917**  
**6-INCH GUN CARRIAGE, MODEL OF 1917, TYPE A**  
**LIMBERS AND TRANSPORT WAGONS, MODEL OF 1917**  
**5-INCH GUN, MODEL OF 1897**  
**AND**  
**6-INCH GUNS, MODELS OF 1900, 1903, 1905**

**(TWENTY-TWO PLATES)**

**MARCH 1, 1918**



WASHINGTON  
GOVERNMENT PRINTING OFFICE  
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WAR DEPARTMENT,  
OFFICE OF THE CHIEF OF ORDNANCE.

*Washington, March 1, 1918.*

This manual is published for the information and government of the Regular Army, National Guard, and National Army of the United States.

By order of the Secretary of War:

CHARLES B. WHEELER,  
*Brig. Gen., Ordnance, N. A., Acting Chief of Ordnance.*

(3)

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PART I.  
DESCRIPTION AND INSTRUCTIONS FOR THE CARE OF  
5 AND 6 INCH GUNS.

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Sec. 1.—5-INCH GUN, MODEL OF 1897.

(Plate I.)

The 5-inch gun is a built-up construction of steel and consists of the tube, jacket, locking hoop, and breech mechanism.

The tube is the foundation of the gun and in it is formed the bore and powder chamber. It is reenforced by the jacket and locking hoop. The jacket is assembled on the tube from the breech end of the latter, and a shoulder on the interior of the jacket near its rear end, abuts against a corresponding shoulder on the exterior of the tube. This prevents forward movement of the jacket. Movement of the jacket toward the rear of the tube is prevented by the locking hoop, which is shrunk on over the front end of the jacket and which has a shoulder on its inner surface which bears against the front face of a corresponding shoulder on the tube just in front of the forward end of the jacket. The breech end of the jacket projects beyond the rear face of the tube and forms a recess, which is threaded with a V-shaped thread with rounded top and bottom, slotted in the manner usual in interrupted-screw ferretures to form the seat for the breechblock. Certain parts of the threaded sectors are cut away and parts of the slotted sectors deepened to provide clearance for the breechblock in swinging it away from the gun. A hinge lug, to which is pivoted the block carrier, projects from the right side of the breech end of the jacket.

The powder chamber is cylindrical, with its breech end slightly enlarged to form a conical gas-check seat, which permits the easy insertion and withdrawal of the gas-checking device. The forward end of the chamber is connected with the rifled portion of the bore by a conical slope. In front of this slope is a second conical surface, in which the depth of the rifling increases from 0.015 of an inch at the origin to 0.03 of an inch, its full depth. This slope is called the forcing slope. Its object is to graduate the movement of the projectile when the gun is fired by easing and distributing the strain of forcing the projectile band to take the rifling.

The rifling is polygroove, with a twist increasing from one turn in 50 calibers at the origin to one turn in 25 calibers at a point 9.41 inches from the muzzle. Thence it is uniform to the muzzle. There are 30 grooves, each 0.3736 of an inch wide and 0.03 of an inch deep. The lands are 0.15 of an inch wide.

The forward part of the projectile extends into the rifled portion of the bore.

Each gun is marked upon the muzzle with its number, the place and date of manufacture, the initials of the inspector, weight, and the model of the gun.

#### BREECH MECHANISM.

(Plate III.)

The principal parts of the mechanism are the breechblock, gear segment, block carrier, lever, pinion, latch, and obturator.

#### BREECHBLOCK.

The breechblock is cylindrical, with an axial hole for the reception of the spindle and washer. The front part of the block for a short distance back is reduced in diameter. This reduced part or nose of the block leaves a space in the breech recess of the gun, in which fouling may collect without interrupting the working of the block.

On the outer surface of the block is cut a V-shaped screw thread with rounded top and bottom. This screw thread is divided circumferentially into eight equal parts and the threads cut from the alternate sectors. The sectors from which the threads are cut are called the slotted sectors and permit the entry of the block past the corresponding threaded sectors in the breech recess. The threaded sectors of the block are then engaged with the threaded sectors of the recess by revolving the block through an angle of  $45^\circ$  about its longitudinal axis. Portions of the threaded sectors on the block are cut away and parts of the slotted sectors deepened to provide clearance between the block and breech recess when the former is swung to or from the gun.

The rear end of the block is turned down to a smaller diameter and the cylindrical surface thus formed is prolonged into the block and increased in length by means of an annular groove cut in the rear face of the block. This cylindrical surface is called the guide cylinder and the annular groove the guide groove of the block. That portion of the rear face of the block which lies outside of the guide groove is called the stop flange. When the block is withdrawn the stop flange strikes the bottom of the stop groove in the block carrier

and limits the rearward motion of the block. The guide cylinder supports the breechblock in the carrier and guides it in its motions of rotation and translation. The guide flange of the block carrier fits into the guide groove of the block and assists in supporting and guiding the latter. Four oil holes are drilled radially from the exterior of the block to the bottom of the guide groove to facilitate oiling the bearing surfaces. These holes also act as air vents. An oil hole cut radially in the nose of the block and closed by a screw is provided for oiling the front face of the block.

The locking recess is cut in the surface of the guide cylinder. The depth of this locking recess gradually increases from rear to front, beginning at zero at the rear and terminating at the front end in a well called the locking recess. When the block is withdrawn the inner end of the latch bolt drops into the locking recess and locks the block positively to the block carrier.

#### GEAR SEGMENT.

The gear segment is attached to the rear end of the breechblock by a spline and two screws. It consists, essentially, of a segment of a bevel gear and a short rack, which mesh with a pinion pivoted on the block carrier and actuated by the lever. Part of the periphery of the pinion is cut into a bevel gear and another part into a pinion, meshing with the corresponding parts of the gear segment. The bevel-gear parts rotate the block and the rack-and-pinion parts translate it. These motions are successive; the termination of the motion of rotation in opening the breech brings the rack and pinion into the proper position to withdraw the block, and the termination of the motion of translation in closing the breech brings the bevel-gear segments into mesh to rotate it.

#### BLOCK CARRIER.

The block carrier is a steel casting pivoted by means of a hinge pin to a hinge plate attached to the jacket on the right side of the breech.

As its name indicates, its principal office is to support the block in its various movements. It is bored to take the breechblock guide cylinder. On the front face of the carrier surrounding this bore is a projecting ring called the guide flange which enters the guide groove of the block and assists in supporting and guiding it. An annular groove called the stop groove, cut in the front face of the carrier at the base of the guide flange, increases the length of the latter and forms a stop against which the stop flange of the breechblock strikes, limiting the motion of the block to the rear.

A lug projects to the rear from the lower part of the block carrier and forms a seat for the pinion. The latter is mounted on this seat upon a pivot in the form of a screw bolt which passes through the



pinion and screws into the lug. This screw-bolt pivot is prevented from unscrewing by the pivot nut, which is screwed on it under the lug. The lever for actuating the pinion is fitted on a squared extension upon the latter. The free end of the lever terminates in a vertical handle.

#### LATCH.

The latch is the locking device for the block carrier. It consists of the latch bolt, latch spring, latch lever, and latch-lever pivot, mounted in the block carrier, and the latch-bolt seat and tripping stud secured to the breech face of the gun by screws.

The latch bolt lies in a radial hole drilled through the block carrier. The end of the bolt nearer the axis of the block is tapered to facilitate its entering the locking recess in the breechblock guide cylinder. It is also slightly beveled on the end, so that it will more easily ride out of the locking recess and up the inclined bottom of the groove. The outer end of the bolt has a mortise cut through it in which one end of the latch lever works. This end of the latch bolt is also slightly beveled to make it ride out of the latch-bolt seat. The latch-bolt seat is a lug secured to the breech face of the gun by two screws.<sup>1</sup> Through it is drilled a radial hole into which the latch bolt enters when the carrier is against the breech of the gun.

The latch lever is pivoted in a circumferential slot cut in the exterior surface of the carrier. The latch-lever pivot is a small screw bolt inserted from the outer face of the carrier. One end of the lever works in the mortise in the latch bolt; the other end is broadened, forming a shoulder against which a spiral spring, called the latch-lever spring, bears. This spring is compressed between the block carrier and the latch-lever shoulder by means of the tripping stud. This operation withdraws the latch bolt from the breechblock. When the block is swung away from the breech, the inner end of the latch bolt rests in the locking recess and locks the block to the carrier. In this position the upper end of the latch lever, against which the spring bears, projects slightly beyond the exterior surface of the carrier. In closing the breech, just before the carrier comes in contact with the breech face of the gun, this projecting part of the lever strikes the beveled surface of the tripping stud and is forced toward the axis of the block. This motion of the lever lifts the latch bolt from the locking recess and leaves the block free to be translated through the block carrier.

The tripping stud is a lug secured to the breech face of the gun by two screws.<sup>1</sup> Its inner face is beveled so as to trip the latch as just explained.

<sup>1</sup> There are a few guns in service having the latch-bolt seat and tripping stud in the form of screw bolt screwed directly into the breech of the gun.

The complete action of the latch is as follows: With the breech closed, the outer end of the latch bolt rests in the latch-bolt seat, locking the block carrier to the breech face of the gun; the inner end of the latch bolt bears against the guide cylinder of the block, and, at the end of the motion of rotation of the block in opening the breech, rests in line with the end of the latch groove. When the block is withdrawn the bolt rides down the inclined bottom of the latch groove and its outer end is withdrawn from the latch-bolt seat, freeing the block carrier from the breech of the gun. At the end of the motion of withdrawal, the inner end of the latch bolt enters the locking recess in the breechblock. As the block carrier is swung away from the gun, the end of the latch lever clears the tripping stud so that the full force of the latch spring comes into play and the latch bolt is forced to the bottom of the locking recess, securely locking the block to the carrier. In closing the breech, the action of the latch is the reverse of that just given. With breech open, the block is locked to the carrier. As the latter is swung against the breech face of the gun, the tripping stud, by means of the lever, raises the latch bolt far enough from the bottom of the latch-groove locking recess for the end of the bolt to ride on the inclined bottom of the groove as the block is moved forward through the block carrier. As the bolt rides up the inclined bottom of the latch groove, its outer end enters the latch-bolt seat and locks the block carrier to the breech face of the gun.

#### OBTURATOR.

The obturator is composed of the following parts: The spindle, front and rear exterior split rings, interior split ring, pad, filling-in disk, spindle nut, and spindle-ball washer.

The object of the obturator is to prevent the escape of gas from the powder chamber to the rear during firing, and to transmit to the breechblock the stress of firing resulting from the pressure of gases upon the bottom of the bore.

The spindle is mounted in the block in the spindle recess. The rear end of the stem is threaded for the spindle nut, while the front end is enlarged into a mushroom-shaped head which forms the bottom of the bore of the gun.

The vent is axial and is drilled through the spindle. A copper bushing, forced into an undercut in the face of the mushroom head, protects the vent from erosion and enables repairs to be easily made. The rear end of the vent is formed into a primer seat to take the primer used to ignite the charge.

The split rings are of steel, accurately finished, and split diagonally through one side. The exterior ones are made of slightly greater diameter than the gas-check seat in the gun and are sprung into place.

The interior one is slightly smaller than its seat on the spindle. The filling-in disk is a steel washer interposed between the gas-checking device and the front face of the breechblock. A slight shoulder on the rear face of the mushroom head supports and centers the front split ring. The rear split ring is similarly held by an offset on the front face of the filling-in disk.

The gas-check pad is a disk having a composition of asbestos and tallow for the earlier model and a composition of 3 parts asbestos and 1 part nonfluid oil for the later model of pad; this is marked on the edge and both sides N. F. O. to distinguish it from the earlier model of pad, compressed under heavy pressure and covered with canvas. It forms a yielding medium for the transmission of pressure to the block. Under the pressure of firing the plastic nature of the pad causes it to press outward toward the gas-check seat and inward against the spindle, forcing the split rings firmly against their seats and completely stopping the passage of gas.

The spindle-ball washer consists of two steel rings with a groove cut in one face of each ring to form a pocket for 19  $\frac{3}{8}$ -inch hardened-steel balls. The rings with the balls between them are held together by a cylinder of  $\frac{1}{32}$ -inch copper, which lines the bore of the rings and has its ends flanged outward over their end faces. The washer is interposed between the spindle nut and the breechblock and reduces the friction between them when the block is rotated.

The spindle nut is screwed on the rear end of the stem of the spindle and holds the spindle in its position in the block. It is turned on the exterior and provided with a screw-driver slot.

The spindle key extends radially downward through the carrier and block, and its inner end enters a longitudinal slot cut in the stem of the spindle. It acts as a stop for limiting the rotation of the block, and also prevents the spindle from turning.

A slot is cut in the guide cylinder in which the key moves during the rotation of the block, and thus the firing mechanism is always held in an upright position.

#### ACTION OF BREECH MECHANISM.

**TO OPEN THE BREECH.**—With the block closed, the lever lies parallel to the face of the breech with handle to the left. Moving the handle to the rear and right, describing an arc about the pinion pivot as a center, rotates the block through an angle of  $45^\circ$  and disengages the threaded sectors on the block from those in the breech recess. A further movement of the handle about the same center draws the block to the rear until the stop flange strikes the bottom of the stop groove and the head of the latch bolt comes opposite the locking recess. This movement of the block to the rear frees the gas check from its seat in the gun sufficiently to enable the block, supported by the carrier, to be swung out of the recess and to one side of the

gun about the block-carrier hinge pin as a center. At the end of the motion of withdrawal, the outer end of the latch bolt is withdrawn from its seat, freeing the block carrier from the breech face of the gun so that a further motion of the lever handle to the right swings the block carrier and block away from the gun. During this movement the inner end of the latch bolt enters the locking recess in the block and locks the block in position in the block carrier.

**TO CLOSE THE BREECH.**—Move the lever handle to the left as far as it will go. The action of the various parts of the mechanism is the reverse of that given above. When the breech is open, it will be noted that the block is locked to the block carrier and that, until it is unlocked, relative motion of the lever handle with reference to the block and carrier can not occur, so that the first movement of the lever handle to the left swings the block into its recess and the carrier against the face of the gun. The action of the latch now frees the block from the carrier and locks the latter to the gun. Further motion of the lever handle first forces the block forward in the breech recess and then rotates it to its seat.

The movement of the lever handle to open or close the breech above described is one continuous motion.

#### FIRING MECHANISM.

(Plate III.)

This mechanism is intended for use with a combination electric and friction primer. It consists of the following principal parts: Slide, slide housing, ejector, firing leaf, contact clip, firing cable, circuit breaker, and safety bar.

The housing is attached to the rear end of the spindle by means of an interrupted screw thread and is secured in place by a spline screw.

The slide has a vertical movement in guides which project from the rear portion of the housing, and its movement is limited by the slide stop, which has a horizontal movement in a slot cut in the housing, its inner end projecting into a groove in the side of the slide. The slide stop is pressed inward by a helical spring.

The firing leaf is pivoted at its upper end to the slide, against which it lies flat when in its normal position.

A notch is cut through both the slide and the leaf, so that when in its lowered position the slide supports the head of the primer against the pressure of the powder gases, while allowing the primer wire to extend through the notch. When the leaf is swung to the rear, its rear face catches the button at the end of the primer wire and explodes the primer.

The contact clip makes electrical connection with the primer by bearing against the button on end of primer wire when the slide is in its lowered position.

The contact clip is held in position in the firing leaf by the contact-clip nut and is insulated from the leaf by the contact clip insulation. One end of the firing cable is attached to the contact clip, the other end to the circuit-breaker contact piece by the firing cable terminals and the contact-clip plugs.

The circuit-breaker contact piece is secured to the outside of the gear segment by two screws and insulated therefrom. When the block is rotated in closing, the circuit-breaker contact piece comes into contact with the circuit-breaker contact pin, making electrical connection with one of the firing leads.

The circuit-breaker contact pin and spring are inclosed in a housing which is attached to the block carrier by two screws and insulated therefrom. The pin is held against the contact piece by the pressure of its spring. The circuit-breaker contact pin forms the end of the firing lead and is held in the circuit-breaker housing by the circuit-breaker housing plug. The firing lead is held in place by the cable clamp screwed to the block carrier.

The ejector consists of a horizontal and a vertical branch with two trunnions near the angle. It is supported in the housing by these trunnions, and in its normal position the lower branch, which is in the form of a fork, hangs vertically over the mouth of the primer seat, engaging the rim of the primer on two sides. The horizontal branch projects to the rear into a recess cut in the front face of the slide. The lower end of this recess is a cam surface. When the slide is raised, this cam surface forces the horizontal branch upward, ejecting the primer. When the slide is lowered, the ejector drops into position against the mouth of the primer seat.

The safety bar is a lever pivoted in the slide housing and actuated by a stud on the gear segment working in a slot cut through the outer end of the safety bar. At the beginning of rotation of the block in opening the breech the inner end of the safety bar rotates inward, entering a slot in the right side of the firing leaf, thus preventing any movement of the firing leaf, except when the breech is fully closed.

#### TO DISMOUNT MECHANISM.

Open the breech.

Unscrew safety-bar pivot and remove safety-bar.

Detach firing cable from circuit-breaker contact piece.

To remove slide, pull outward on slide stop and lift slide from housing. Unscrew housing spline screw and revolve housing 90° to the right, when the housing may be drawn to the rear from the spindle. Unscrew the spindle nut and the spindle-key screw, and remove the spindle key. Be careful not to remove spindle nut and spindle key before opening the breech, as in that case the split rings are liable to drop down and prevent the withdrawal of the block. The spindle, split rings, pad, etc., are then free to be removed from

the block. Take out the two gear-segment screws and drive off the gear segment, using a copper drift to prevent injury to the metal. Take out the latch-lever pivot and remove the latch lever, spring, and bolt. The block is then free to be removed from the carrier. Drive out the pivot pin and remove the pivot nut, unscrew the pivot, and the pinion and lever are then free to be removed from the carrier. Drive out the hinge pin, being careful to support the carrier while doing so, and the carrier is then free from the gun.

The operations in mounting the mechanism are the reverse of those used in dismantling.

*Nomenclature for 5-inch gun, model of 1897, Stockett breech mechanism, fitted with combination electric friction firing attachment.*

(Plate II.)

- |                                  |                                     |
|----------------------------------|-------------------------------------|
| 1. Block carrier.                | 35. Guide flange.                   |
| 2. Hinge pin.                    | 36. Stop flange.                    |
| 2a. Hinge-pin spring catch.      | 37. Locking recess.                 |
| 2b. Hinge-pin oil-hole screw.    | 37a. Breechblock pallet.            |
| 3. Spindle key.                  | 37b. Breechblock-pallet screw.      |
| 4. Spindle-key screw.            | 38. Housing.                        |
| 5. Latch bolt.                   | 39. Housing spline screw.           |
| 6. Latch lever.                  | 40. Slide.                          |
| 7. Latch-lever spring.           | 41. Slide handle.                   |
| 8. Latch-lever pivot.            | 42. Slide catch.                    |
| 9. Lever.                        | 42a. Slide-catch spring.            |
| 10. Pinion.                      | 43. Firing leaf.                    |
| 11. Pinion pivot.                | 44. Firing-leaf pivot.              |
| 12. Pinion-pivot nut.            | 44a. Firing-leaf spring.            |
| 12a. Pinion-pivot pin.           | 44b. Firing-leaf spring screw.      |
| 13. Breechblock.                 | 45. Firing-leaf pivot pin.          |
| 14. Breechblock oil-hole screw.  | 46. Ejector.                        |
| 15. Gear segment.                | 47. Firing-cable.                   |
| 16. Gear-segment screws.         | 48. Cable clamp.                    |
| 17. Spindle.                     | 49. Cable-clamp screw.              |
| 18. Spindle nut.                 | 50. Circuit-breaker contact piece.  |
| 19. Spindle-nut clamp screw.     | 51. Contact screws.                 |
| 20. Spindle pallet.              | 52. Contact clip.                   |
| 21. Spindle-pallet screws.       | 53. Contact-clip nut.               |
| 22. Spindle-ball washer.         | 53a. Contact-clip insulation.       |
| 23. Vent bushing (copper).       | 54. Contact-clip nut insulation.    |
| 24. Exterior split ring (front). | 55. Firing-cable terminal.          |
| 25. Exterior split ring (rear).  | 56. Contact-clip plug.              |
| 26. Interior split ring.         | 57. Circuit-breaker housing.        |
| 27. Gas-check pad.               | 58. Circuit-breaker housing screws. |
| 28. Filling-in disk.             | 59. Circuit-breaker contact pin.    |
| 29. Tripping stud.               | 60. Circuit-breaker housing plug.   |
| 30. Tripping-stud screws.        | 61. Safety bar.                     |
| 31. Latch-bolt seat.             | 62. Safety-bar pivot.               |
| 32. Latch-bolt seat screws.      | 63. Safety-bar operating stud.      |
| 33. Guide cylinder.              | 64. Slide stop.                     |
| 34. Guide groove.                |                                     |



Table of weights, principal dimensions, etc., 5-inch gun, model of 1897.

Weight	pounds	7,583
Total length	inches	231.5
Length of bore	calibers	44.6
Maximum diameter, breech	inches	16.5
Diameter of muzzle	do	7.3
Rifling:		
Number of grooves		30
Width of grooves	inch	0.3736
Depth of grooves	do	0.03
Width of lands	do	0.15
Twist	{ 1 turn in 50 to 1 turn in 25 calibers.	
Powder chamber (cylindrical):		
Diameter	inches	5.5
Length	do	27.505
Capacity	cubic inches	660
Total capacity of bore	do	4,550
Projectile:		
Kind	Common steel shell, Mark II.	
Weight filled	pounds	52
Ratio, weight to weight of piece		1 to 145
Length, base to point (including fuze)	inches	18.36
Weight of bursting charge (high explosive)	pounds	6.99
Sectional density		2.08
Travel of projectile	inches	195.495
Powder:		
Kind	Nitrocellulose.	
Weight (including igniter), approximate	pounds	15.75
Density of loading		0.6606
Muzzle velocity, high	feet per second	2,600
Muzzle velocity, reduced	do	1,550
Maximum pressure per square inch	pounds	30,000
Muzzle energy	foot-tons	2,398

## Sec. 2.—6-INCH GUN, MODEL OF 1900 (B. C. and D. C.).

(Plate I.)

These guns have two A hoops, and the thread of the breechblock is cut in a breech bushing instead of directly in the jacket itself.

The rifling is polygroove, with a twist increasing from one turn in 50 calibers at the origin to one turn in 25 calibers at 16.32 inches from the muzzle; thence it is uniform to the muzzle. There are 36 grooves, each 0.3736 inch wide and 0.04 inch deep; 36 lands, each 0.15 inch wide.

The chief difference between these guns is in the recoil bands and splines. The band on the 1900 B. C. gun has but one lug upon it and the splines are planed on the surface of the A hoop.

The band on the 1900 D. C. gun has three lugs and the splines, made of bronze, are attached to the A hoop by countersunk screws.

## BREECH MECHANISM.

(Plate IV.)

The loading tray pivot has a solid head and is screwed into the breech face of the gun and held in place by a set screw. With this exception the breech and firing mechanisms of these guns are the same as those for the 5-inch gun, model of 1897, except that the dimensions are larger.

It is anticipated that one battery will be made up of two 6-inch guns, model of 1900 (B. C.), on 6-inch gun carriages, model of 1917, type A, and two 6-inch guns, model of 1900 (D. C.), on 6-inch gun carriages, model of 1917.

Table of weights, principal dimensions, etc., 6-inch gun, model of 1900 (B. C. and D. C.).

Weight	pounds	{ B. C. 19.968 D. C. 20,424
Total length	inches	
Length of bore	calibers	50
Maximum diameter, breech	inches	24
Diameter of muzzle	do	9.8
Rifling:		
Number of grooves		36
Width of grooves	inch	0.3736
Depth of grooves	do	0.04
Width of lands	do	0.15
Twist	1 turn in 50 to 1 in 25 calibers.	
Powder chamber (cylindro-conical):		
Diameter	inches	8
Length	do	43.425
Capacity	cubic inches	2,114
Total capacity of bore	do	9,491
Projectile:		
Kind	Common steel shell, Mark II.	
Weight, filled and fuze	pounds	90
Ratio weight to weight of gun	1 to 180	
Sectional density	2.5	
Length, including fuze	inches	23.08
Weight bursting charge, high explosive	pounds	13.69
Powder:		
Kind	Nitrocellulose.	
Weight (including igniter) approximate	pounds	30
Density of loading	0.4307	
Muzzle velocity, high	feet per second	2,600
Muzzle velocity, reduced	do	1,550
Maximum pressure per square inch	pounds	30,000
Muzzle energy	foot-tons	4,143

### Sec. 3.—6-INCH GUN, MODEL OF 1903.

(Plate II.)

This gun is similar to the 6-inch gun, model of 1900, except in the following particulars:

The thread for the breechblock is cut directly in the jacket.

The  $A_2$  hoop does not extend entirely to the rear face of the jacket. The resulting annular space is filled by a hinge plate, which is fastened by axial screws to the  $A_2$  hoop, and carries on its right side lugs for hinging the block carrier.

The rifling is polygroove, with a twist increasing from one turn in 50 calibers (zero) at the origin to one turn in 25 calibers at 16.66 inches from the muzzle; thence it is uniform to the muzzle. There are 36 (54) grooves, each 0.3736 (0.2091) inch wide and 0.04 (0.05) inch deep; 36 (54) lands, each 0.15 (0.14) inch wide. The numbers in parentheses refer to the last guns of this model manufactured.

#### BREECH MECHANISM.

(Plate V.)

The principal parts of the breech mechanism are the breechblock, block carrier, operating spool, operating lever, rack, latch, obturator, and loading tray.

#### BREECHBLOCK.

The breechblock is in the form of a truncated ogive, with the interior hollowed out, forming a central cylindrical stem, which is prolonged beyond the rear face of the block. Through the center of the stem is an axial hole for the reception of the obturator spindle and obturator spring. The front part of the block, for a short distance back, is reduced in diameter, leaving a space in the breech recess of the gun in which fouling may collect without interrupting the working of the block.

On the outer surface of the block is cut a screw thread with rounded top and bottom, the rear face of the thread more inclined to the surface of the block than the front face. This screw thread is divided circumferentially into 12 equal parts and the thread cut from alternate sectors.

An oil hole cut radially in the nose of the block and closed by a screw is provided for oiling the front face of the block.

A stop groove is cut through the stem of the block to allow the spindle key to pass into the spindle groove. The spindle key thus serves the purpose of a breechblock stop.

A roller is attached to the block by an axle, screwed into the block. This roller works in the roller groove of the operating pool, entering

the groove at the beginning of rotation in closing the breech and remaining in the groove until the end of rotation in opening the breech. The functions of the roller are to act as a lock to prevent rotation of the block under firing pressure, to give a slow and powerful thrust to the block at the beginning of rotation in opening the breech, and to complete rotation of block in closing the breech after rack tooth disengages.

A translating groove is cut in the surface of the block. The translating stud on the operating spool works in this groove to cause translation of the block.

On the rear end of the breechblock stem are two teeth which engage the tooth of the rack to cause rotation of the breechblock.

#### BLOCK CARRIER.

The block carrier is pivoted by means of the hinge pin to the hinge lugs of the hinge plate. The block carrier is provided with a central hub bored to take the stem of the breechblock. A groove is cut in the inside of the hub to allow the teeth on the block stem to pass in assembling. A slot is cut through the hub to permit the spindle key to pass into the stop groove. The upper end of the spindle key is held in a slot cut in the upper part of the block carrier. The firing lever passes through and is pivoted in the same slot, the firing-lever pivot passing through the spindle key and holding it in place. On the rear face of the carrier a horizontal groove is formed to carry the rack. The slide stop is screwed into the top surface of the upper wall of the rack groove.

#### OPERATING SPOOL AND HINGE PIN.

The operating spool is placed vertically between the two block-carrier hinge lugs. The hinge pin passes vertically through the center of the spool. That portion of the hinge pin within the spool is squared, causing the spool to rotate with the hinge pin. The roller groove is cut in the surface of the spool. The translating stud is formed on the surface of the spool. A groove is cut near the bottom of the spool for the upper latch stud. A notch is cut in the lower edge of the spool to receive the end of the latch body in locking together the spool and carrier while the block is swung away from the breech.

That part of the hinge pin within the upper hinge lugs of the hinge plate and block carrier is cylindrical. The remainder of the hinge pin is squared. The necessary cylindrical surface for that part of the hinge pin within the lower hinge lugs of the hinge plate and block carrier is secured by the carrier bushing and the hinge-lug bushing.

## OPERATING LEVER.

The operating lever fits over the squared lower end of the hinge pin and is held in place by a nut. The nut is held in place by a taper pin. The breech mechanism is actuated by the operating lever, acting through the operating spool. When the breech is closed the operating lever lies against the face of the breech and is held in this position by the lever latch. The lever latch consists of a bolt with vertical motion in a housing and pressed downward by the lever-latch spring. The housing is attached to the breech plate by the housing screws. The downward motion of the latch bolt is limited by a stud on its upper end striking the end of a groove in the housing in which the stud travels. The head of the bolt is rounded. When the operating lever is against the breech the head of the bolt enters a corresponding depression in the top surface of the operating lever, holding the lever against the breech. The depression is formed in a pallet screwed into the operating lever.

## RACK.

The rack has a horizontal motion in a groove in the rear face of the block carrier. A tooth on its inner end engages between teeth on the stem of the breechblock. A lug on the outer end of the rack works in the rotating groove in the spool. A housing is formed on the rear face of the rack for the rack lock. The rack-lock bolt has a vertical motion in this housing and is pressed upward by a spring. A handle is screwed into the lower end of the rack-lock bolt. The upward motion of the bolt is limited by a shoulder on the handle striking the housing. The upper end of the bolt enters a slot in the slide of the firing mechanism, causing the slide to move horizontally with the rack. By pulling down on the handle the bolt is withdrawn from the notch in the slide, allowing the slide to be operated independently of the rack.

## LATCH.

The latch is housed in a notch cut through the lower hinge lug of the block carrier and held in place by the latch retainer. A stud on the upper end of the latch rides in a groove cut in the operating spool and actuates the slide. A similar stud rises in a groove cut in the lower-hinge plate lug. When the block carrier is against the breech, the lower stud rests in a vertical portion of the groove in the hinge-lug pallet, locking the carrier in position during rotation and translation of the block. In opening the breech when translation of the block is complete the latch is lifted by the upper stud, causing the lower stud to rise out of the vertical groove and free the carrier from the face of the breech. At the same time the upper end of the

body of the latch enters a notch cut in the operating spool, locking the spool and block carrier together while the block is swung away from the breech. The action of the latch in closing the breech is the reverse of that in opening.

The latch retainer consists of a block of steel provided with a ring handle and a spring catch. It is inserted in the latch slot in the hinge lug and holds the studs of the latch in their grooves. It is prevented from dropping out of the slot by the latch retainer spring. A dovetail projection on the latch works in a corresponding slot in the latch retainer to hold the parts parallel and in proper contact.

## OBTURATOR.

The principal parts of the obturator are the mushroom head, spindle, front and rear exterior split rings, interior split ring, pad, filling-in disk, and spindle spring.

The housing of the firing mechanism is screwed on the rear end of the spindle. The spindle spring bears against the housing and against a shoulder on the stem of the block, causing the mushroom head to compress the pad, split rings, etc., sufficiently to hold them in proper position.

A groove is cut in the spindle for the spindle key. The spindle key thus prevents the obturator and firing mechanism housing from rotating with the block.

Two holes are cut in the front face of the mushroom head to receive a wrench to be used in screwing the housing on the spindle and detaching it therefrom.

The remaining parts of the obturator are similar to those described for 5-inch gun, model 1897.

## OPERATION OF THE BREECH MECHANISM.

To close the breech grasp the handle of the operating lever and carry it to the left until the lever latch engages. The operating spool turns with the lever. During the first part of this motion the latch body is entered in its notch in the spool, causing the block carrier to swing with the spool until the carrier strikes the breech. At this moment the latch body drops out of its notch in the spool, freeing the spool from the carrier. The downward motion of the latch causes the lower latch stud to enter the vertical portion of the groove in the hinge-lug pallet, locking the carrier against the breech. As the spool continues to rotate, the translating stud enters the translating groove and the block is forced forward into the breech recess. At the end of translation, the translating stud leaves the translating groove, freeing the spool for further rotation. The rack stud now enters the rotating



groove and the rack is forced to the left, acting through the teeth to rotate the block to the right. Before the rotation of the block is complete, the rack tooth passes beyond the teeth on the stem of the block, the edge of the left tooth on the stem being faced off for this purpose. The roller, actuated by the cam-shaped roller groove, then completes the rotation of the block. The lower part of the roller groove is so shaped that the roller acts as a stop to prevent the block from rotating under firing pressure. In opening the breech, the roller causes the block to rotate until the rack tooth engages the teeth on the block stem. The remaining operations are the reverse of those in closing the breech.

#### FIRING MECHANISM.

The principal parts of the firing mechanism are the housing, slide, firing leaf, ejector, contact clip, and firing cable.

The housing is screwed on the rear end of the obturator spindle and does not rotate with the block, due to the action of the spindle key. A groove on the rear face of the housing carries the slide, which has a horizontal motion on the right side of the axis of the gun limited by the slide stop. A notch on the underside of the slide receives the rack-lock bolt. The left end of the slide is V-shaped, with the point of the V to the right. The point of the V is extended to the right by a notch cut through the slide. When the slide is in position, breech closed, the stem of the primer passes through the notch, the base of the primer being supported by the body of the slide. The firing leaf is a vertical lever, pivoted to the slide by the firing-leaf pivot and pivot pin. A horizontal notch is cut into the left side of the lower arm of the firing leaf. The stem of the primer passes through this notch when the slide is in firing position. The contact clip is attached to the firing leaf by the clip housing and housing nut. The housing is insulated from the slide by the clip-housing insulation. When the slide is in firing position, the clip embraces the button on the end of the primer stem, forming electrical connection with the primer. One end of the firing cable is connected to the contact clip by the firing cable terminal and by the contact clip plug. The other end of the firing cable is similarly attached to the firing-cable bracket on the breech of the gun. The lower arm of the firing lever lies against the upper arm of the firing leaf when the slide is in firing position. When the lanyard is drawn to the rear, the lower end of the firing lever presses the upper end of the firing leaf to the front, causing the lower end of the leaf to strike the primer button and draw it to the rear, exploding the primer. When the rack moves to the right in opening the breech, the rack lock carries with it the slide, leaving the primer free to be

ejected and freeing the leaf from contact with the firing lever. In closing the breech the leaf does not come in contact with the firing lever nor does the contact clip embrace the primer button until the rotation of the block is practically completed. By drawing downward on the rack-lock handle, the slide is freed from the rack and may be moved independently, to permit the placing of a primer in the vent without opening the breech. The ejector consists of a horizontal lever, pivoted to the housing of the firing mechanism. The right end lies in a groove cut in the end of the spindle. This end is forked, the fork partially surrounding the mouth of the vent and lying in front of the rim of the primer. The left end of the ejector is broadened to be struck with the hand. The ejector spring, acting on the left end of the ejector, holds the fork normally in its groove in the spindle. One side of this groove is beveled to allow the fork to ride out of the groove in dismounting the mechanism. When the left end of the ejector is struck, the fork acts on the rim of the primer to throw the primer clear of the vent.

#### TO DISMOUNT THE MECHANISM.

Open the breech, withdraw the latch retainer, and remove the latch. The breechblock is now free to be translated and rotated as if it were in the breech recess. Hold the block carrier and rotate the operating lever until translation of the block is completed. Remove the firing-lever pivot pin and pivot. Lift the firing lever out of its slot in the block carrier. Lift the spindle key out of its slot in the block carrier. If the spindle key seems to stick, move the operating lever slightly to and fro until the key is free. Continue the rotation of the operating lever until rotation of the block is completed. Detach firing cable from the firing-cable bracket. Support the housing of the firing mechanism, and with the wrench provided for the purpose rotate the mushroom head to the left until the housing is free from the spindle when the housing may be withdrawn to the rear by holding down the rack-lock bolt. Remove the spindle from the block and remove the spindle spring. The operating lever should now be rotated a short distance farther. This causes the teeth on the end of the stem to enter the groove provided for them in the hub of the carrier. The stem of the block may now be removed from the carrier. Slide the rack to the left out of its groove. Remove the hinge-pin nut and take off the operating lever. Support the block carrier and drive out the hinge pin, using a copper drift. The block carrier and operating spool are now free to be removed.

To remove the loading tray, press down on the tray-latch bolt and lift the tray from its place.

To dismount the lever latch, force the latch bolt upward until the stud is free of its groove. Turn the bolt 180° until the stud points to

the left, when the bolt may be lowered out of the housing, the stud passing through a groove cut in the housing for this purpose.

#### TO MOUNT THE MECHANISM.

Place the hinge-lug bushing in its seat so that one of the diagonals of its rectangular interior will be perpendicular to the face of the breech. Place the carrier bushing in its seat so that one of the diagonals of its rectangular interior will lie in the plane of the carrier. Support the carrier so that its plane is perpendicular to the face of the breech, placing its lugs in position to receive the hinge pin. Place the spool between the lugs of the carrier, and turn so that the circular lower end of the roller groove faces the body of the carrier. Insert the hinge pin carefully, using no force unless positive that the rectangular holes in the spool, hinge-lug bushing, and carrier bushing are in line. Place the operating lever on the hinge pin so that the lever lies in the plane of the carrier and screw on the hinge-pin nut. Rotate the operating lever slightly to the left and enter the stem of the breechblock in the carrier until the roller enters the roller groove. Place the rack in its groove. Press the block toward the carrier, at the same time rotating the operating handle slightly to the right and entering the stud of the rack in the rotating groove. Assemble the obturator and firing-mechanism housing, being careful to stop the rotation of the mushroom head when the ejector drops into its slot in the spindle. The slide must be assembled in the housing before the housing is assembled to the spindle. Rotate the operating lever until rotation of the block is completed. Assemble the spindle key and firing lever; rotate the operating lever until translation of the block is completed. Insert the latch. On one end of the latch the dovetail projection for the latch retainer is cut away. This is the lower end of the latch. Assemble the latch retainer.

#### Nomenclature for 6-inch gun, model of 1903.

(Plate V.)

- |                                |                             |
|--------------------------------|-----------------------------|
| 1. Hinge plate.                | 14. Carrier bushing.        |
| 2. Hinge-plate screw.          | 15. Hinge-lug bushing.      |
| 3. Breechblock.                | 16. Latch groove.           |
| 4. Block carrier.              | 17. Hinge-lug pallet.       |
| 5. Operating lever.            | 18. Hinge-lug pallet screw. |
| 6. Lever-latch bolt.           | 19. Latch.                  |
| 7. Lever-latch bolt spring.    | 20. Latch retainer.         |
| 8. Lever-latch housing.        | 21. Latch-retainer spring.  |
| 9. Lever-latch housing screws. | 22. Roller.                 |
| 10. Lever-latch pallet.        | 23. Roller axle.            |
| 11. Hinge pin.                 | 24. Hub of block carrier.   |
| 12. Hinge-pin nut.             | 25. Stem of breechblock.    |
| 13. Operating spool.           | 26. Spindle key.            |

- |                                 |                                  |
|---------------------------------|----------------------------------|
| 27. Spindle-key groove.         | 43. Firing-leaf pivot pin.       |
| 28. Obturator-spindle spring.   | 44. Firing-leaf spring.          |
| 29. Breechblock oil-hole screw. | 45. Firing lever.                |
| 30. Rack.                       | 46. Lanyard loop.                |
| 31. Rack-lock bolt.             | 47. Firing-lever pivot.          |
| 32. Rack-lock housing.          | 48. Firing-lever pivot pin.      |
| 33. Rack-lock handle.           | 49. Firing-lever spring.         |
| 34. Rack-lock spring.           | 50. Contact clip.                |
| 35. Slide stop.                 | 51. Contact-clip nut.            |
| 36. Ejector.                    | 52. Contact-clip insulation.     |
| 37. Ejector pivot.              | 53. Contact-clip-nut insulation. |
| 38. Ejector-pivot pin.          | 54. Contact-clip plug.           |
| 39. Housing.                    | 55. Firing cable.                |
| 40. Slide.                      | 56. Firing-cable terminal.       |
| 41. Firing leaf.                | 57. Firing-cable bracket.        |
| 42. Firing-leaf pivot.          |                                  |

#### Table of weights, principal dimensions, etc., 6-inch gun, model of 1903.

Weight (gun and recoil band).....	pounds.....	20,766
Total length.....	inches.....	310.4
Length of bore.....	calibers.....	50
Maximum diameter, breech.....	inches.....	24
Diameter of muzzle.....	do.....	9.8
Diameter of trunnions.....	do.....	7
Length of trunnions.....	do.....	5
Distance between rimbases.....	do.....	25.7
Axis of trunnions from muzzle.....	do.....	212.5
Rifling (dimensions in parentheses relate to the last guns of this model manufactured):		
Number of grooves.....	} (54)	36
Width of grooves.....		0.3736 (0.2091)
Depth of grooves.....	} (0.05)	0.04
Width of lands.....		0.15 (0.14)
Twist.....	{ 1 turn in 50 to 1 in 25 calibers. (0 to 1 turn in 25 calibers.)	
Powder chamber (cylindro-conical):		
Diameter.....	inches.....	8
Length.....	do.....	43.405
Capacity.....	cubic inches.....	2,114
Total capacity of bore.....	do.....	9,504
Projectiles:		(9.492)
The same as for 6-inch gun, model of 1900.		
Travel of projectile.....	inches.....	256.845
Powder:		
Kind.....	Nitrocellulose.	
Weight (including igniter), approximate.....	pounds.....	30
Density of loading.....		0.4307
Muzzle velocity, high.....	feet per second.....	2,600
Muzzle velocity, reduced.....	do.....	1,550
Maximum pressure per square inch.....	pounds.....	30,000
Muzzle energy.....	foot-tons.....	4,143

#### Sec. 4.—6-INCH GUN, MODEL OF 1905.

(Plate II.)

This gun has but one A hoop, which is locked to the D hoop by a locking hoop.

The threads for the breechblock are cut in a breech bushing instead of in the jacket.

The lugs for hinging the breechblock are carried on a hinge ring secured to the jacket by radial screws.

The rifling is polygroove, with a twist increasing from zero at the origin to one turn in 25 calibers at 16.1 inches from the muzzle; thence it is uniform to the muzzle. There are 54 grooves, each 0.2091 inch wide and 0.05 inch deep; 54 lands, each 0.14 inch wide.

#### BREECH MECHANISM.

(Plate VI.)

The principal parts of the breech mechanism are the breechblock, obturator, block carrier, gear segment, operating lever, operating link, rack, latch, and loading tray.

#### BREECHBLOCK.

The breechblock is conical, with the interior hollowed out forming a central cylindrical stem, which is prolonged beyond the rear face of the block. Through the center of the stem is an axial hole for the reception of the obturator spindle and obturator spring. The front face of the block, for a short distance back, is reduced in diameter, leaving a space in the breech recess of the gun in which fouling may collect without interrupting the working of the block.

On the outer surface of the block is cut a screw thread, with rounded top and bottom, the rear face of the thread more inclined to the surface of the block than the front face. This screw thread is divided circumferentially into 12 equal parts and the thread cut from alternate sectors.

A stop groove is cut through the stem of the block to allow the spindle key to pass into the spindle groove. The spindle key thus serves the purpose of a breechblock stop.

A notch is cut in the surface of the stem near its rear end in which the head of the safety plunger enters. An oil hole is cut radially in the nose of the block to provide for oiling the front face of the block.

The parts of the obturator and the spindle spring are similar to those described for the 6-inch gun, model of 1903.

#### BLOCK CARRIER.

The block carrier is pivoted by means of the hinge pin to the hinge lugs of the hinge ring. The carrier is provided with a central hub

bored to take the stem of the breechblock. A groove is cut in the inside of the hub to allow the teeth of the gear segment to pass in assembling. A slot is cut through the hub to allow the spindle key to pass into the stop groove. The upper end of the spindle key is held in a slot cut in the upper part of the block carrier. The firing lever passes through and is pivoted in the same slot, the firing-lever pivot passing through the spindle key and holding it in place. On the rear face of the carrier a horizontal groove is formed to carry the rack. A lug is formed on the carrier to which the operating lever is pivoted. A stop is formed on the right end of the carrier. This stop limits the swing of the carrier when the breech is opened by striking the gun.

#### GEAR SEGMENT.

The gear segment incloses the rear end of the stem of the breechblock and is held in place by three radial screws riveted in their seats. Two teeth are formed on the segment, which engage the rack tooth to cause rotation of the block. The left tooth is grooved to engage the translating ridge of the rack to cause translation of the block.

#### OPERATING LEVER.

The operating lever is pivoted to the carrier by the operating-lever pivot. The pivot is secured by the pivot key. The operating link is attached to the operating lever by a fork and pivot. This pivot is also called the operating-lever pivot and is identical with the pivot used to attach the operating lever to the carrier. The operating-lever handle is screwed into the lever and secured by a pin. The operating-lever handle sleeve fits over the handle. The operating-lever handle washer lies in a depression in the upper end of the sleeve. The upper end of the handle is riveted to hold the washer and sleeve in place. The operating lever is held in place when the breech is closed by the lever latch. The lever-latch housing is attached to the carrier by the housing screws. The parts of the lever latch, together with the bolt seat in the lever, are similar to those described for the 6-inch gun, model of 1903.

#### RACK.

The rack has a horizontal movement in a groove in the rear face of the carrier. The rack is connected to the operating lever by the operating link. The link is attached to the rack by the operating-link pivot. A tooth is formed on the top surface of the rack which engages the teeth of the gear segment. A diagonal ridge is formed on the top surface of the rack which engages a groove in the left tooth of the gear segment to cause translation of the block. A notch



is cut in the underside of the rack in which the end of the latch enters when translation of the block is completed in opening the breech.

#### LATCH.

The latch has a vertical movement in a notch in the lower part of the carrier. The latch is passed upward by the latch spring. The lower end of the spring is supported by the latch detent, which consists of a horizontal plate seated in grooves in the carrier and held in place by two pins. A hook is formed on the lower end of the latch. This hook engages the carrier latch catch when the carrier is against the breech. The catch is seated in a hole cut in the breech face of the gun and held in place by the catch screws. When the breech is open, the upper end of the latch enters the notch in the rack, preventing any movement of the block. When the carrier is swung against the breech, the latch catch acts on a cam surface on the front side of the latch hook, forcing the hook downward until it is fully engaged in the catch. This downward movement of the latch withdraws the upper end of the latch from the rack, freeing the rack to operate the block. The upper end of the latch is now held down by the rack, thus preventing the hook from rising free of the catch and locking the carrier against the breech.

#### FIRING MECHANISM.

The principal parts of the firing mechanism are the housing, slide, firing lever, firing leaf, safety plunger, ejector, and circuit breaker.

The housing is screwed on the rear end of the obturator spindle. The housing does not rotate with the block, due to the action of the spindle key. The slide has a horizontal movement in a groove in the housing, limited by the slide stop. The slide is operated entirely by hand and carries a handle for this purpose. The slide catch holds the slide in its firing position. The catch consists of a lever pivoted at the base of the handle. A hook on one end of the catch engages a shoulder on the housing. The hook is pressed forward by the slide-catch spring. The hook is disengaged from the shoulder by the pressure of the hand on the other arm of the catch in grasping the slide handle.

The firing lever, firing leaf, contact clip, and method of attachment of the firing cable are as described for 6-inch gun, model of 1903.

The safety plunger has a vertical movement in a slot cut in the spindle key and extended in the carrier. The upper end of the plunger carries a stud, which works in a groove in the spindle key to guide the plunger and limit its downward movement. The plunger is pressed downward by the plunger spring. When the breech is fully closed, the lower end of the plunger enters a notch cut in the surface of the gear segment. When rotation of the block in opening

the breech begins, the plunger is forced upward out of the notch. The upper end of the plunger now engages a shoulder on the firing lever, preventing any movement of the lever until the breech is again fully closed.

The circuit-breaker housing is attached to the carrier by two screws. Two contact pins pass vertically through the housing and are held in place by the contact-pin nuts screwed on their lower ends. The lower ends of the pins are rounded. The firing cable is attached to contact pin "B" by a split pin with enlarged end and leads to the contact clip. The firing lead is attached to contact pin "A." Both contact pins are insulated from the housing.

The contact housing is attached to the operating lever by two screws. Two contact plungers with rounded heads are forced upward in the housing by the plunger springs. The lower ends of the springs are supported by the contact-plunger detent, which consists of a plate attached to the under side of the housing by a screw. The upward movement of the plungers is limited by shoulders on the plungers. The housing and the housing screws are insulated from the operating lever. When the breech is closed, the contact plungers are carried by the operating lever under the contact pins, thus completing the firing circuit only when the breech is fully closed.

The ejector is pivoted in the housing by two trunnions. The left end of the ejector normally lies against the end of the spindle and partially surrounds the mouth of the vent. The right end of the ejector extends into the ejector groove in the front face of the slide. When the slide is moved to the right, the right end of the ejector is forced forward by the cam-shaped end of the ejector groove, causing the left end of the ejector, acting on the rim of the primer, to throw the primer from the vent.

#### OPERATION OF THE BREECH MECHANISM.

To close the breech, rotate the operating lever to the left until the lever latch engages. During the first part of this motion the upper end of the latch is engaged in its notch in the rack, causing the carrier to swing with the operating lever. When the carrier strikes the breech, the latch hook engages the catch, locking the carrier to the breech. This motion of the latch frees the rack. The rack is now forced to the left by the operating lever, acting through the operating link. The left tooth on the segment being engaged with the diagonal ridge on the rack, the motion of the rack forces the block forward into the breech recess. At the end of translation of the block the ridge of the rack leaves its groove in the segment tooth and the rack tooth engages the segment teeth, causing the block to rotate until the threaded sectors of the block and breech recess are fully engaged.

## TO DISMOUNT THE MECHANISM.

Open the breech.

Press downward on the latch hook. This frees the mechanism for operation as if the block were in the breech recess. Hold the carrier and rotate operating lever until translation of the block is complete. Remove the firing lever and spindle key as described for 6-inch gun, model of 1903. Detach firing cable from contact pin. Support firing mechanism housing and remove housing, obturator, and obturator spring as described for 6-inch gun, model of 1903. Remove operating-lever pivot attaching link to operating lever. Rotate block to the right until the segment teeth are opposite their groove in the interior of the carrier hub. The rack may now be removed from its groove to the left, carrying with it the link. The block may now be withdrawn from the carrier, the segment teeth passing through their groove in the carrier hub. Remove the operating lever pivot key and pivot. The lever is then free from the carrier. Detach the firing lead from the contact pin and remove hinge pin and carrier as described for 6-inch gun, model of 1903. The operations in mounting the mechanism are the reverse of those used in dismounting.

## Nomenclature for 6-inch gun, model of 1905.

(Plate VI.)

- |                                    |                                    |
|------------------------------------|------------------------------------|
| 1. Hinge ring.                     | 23. Operating-lever handle washer. |
| 2. Hinge-ring screws.              | 24. Operating-lever pivot.         |
| 3. Breech bushing.                 | 25. Operating-lever pivot key.     |
| 3a. Breech-bushing securing screw. | 26. Lever-latch bolt.              |
| 4. Breechblock.                    | 27. Lever-latch bolt spring.       |
| 5. Block carrier.                  | 28. Lever-latch housing.           |
| 5a. Carrier stop.                  | 29. Lever-latch housing screw.     |
| 6. Hub of carrier.                 | 30. Lever-latch bolt seat.         |
| 7. Stem of block.                  | 31. Operating link.                |
| 8. Spindle-key groove.             | 32. Operating-link pivot.          |
| 9. Spindle spring.                 | 33. Rack.                          |
| 10. Spindle key.                   | 34. Gear segment.                  |
| 11. Carrier-latch catch.           | 35. Firing-mechanism housing.      |
| 12. Carrier-latch catch screw.     | 36. Slide.                         |
| 13. Carrier latch.                 | 37. Ejector.                       |
| 14. Carrier-latch spring.          | 38. Firing lever.                  |
| 15. Carrier-latch detent.          | 38a. Firing-lever spring.          |
| 16. Carrier-latch detent pins.     | 38b. Firing-lever spring screw.    |
| 17. Hinge pin.                     | 39. Lanyard loop.                  |
| 18. Hinge-pin nut.                 | 40. Firing-lever pivot.            |
| 19. Hinge-pin nut pin.             | 41. Firing-lever pivot pin.        |
| 20. Operating lever.               | 42. Firing leaf.                   |
| 21. Operating-lever handle.        | 43. Firing-leaf spring.            |
| 22. Operating-lever handle sleeve. | 44. Firing-leaf pivot.             |

## Nomenclature for 6-inch gun, model of 1905—Continued.

- |                                    |                                  |
|------------------------------------|----------------------------------|
| 45. Firing-leaf pivot pin.         | 56. Contact housing.             |
| 46. Contact clip.                  | 57. Contact-housing screw.       |
| 47. Contact-clip insulation.       | 58. Contact plungers.            |
| 48. Contact-clip nut.              | 59. Contact-plunger springs.     |
| 49. Firing cable.                  | 60. Slide stop.                  |
| 50. Firing-cable terminal.         | 61. Slide-catch pivot.           |
| 51. Circuit-breaker housing.       | 62. Slide-catch pivot pin.       |
| 52. Circuit-breaker housing screw. | 63. Safety plunger.              |
| 53. Contact pin A.                 | 64. Safety-plunger spring.       |
| 54. Contact pin B.                 | 69. Contact-clip nut insulation. |
| 55. Contact-pin nut.               | 70. Contact-clip plug.           |

## Table of weights, principal dimensions, etc., 6-inch gun, model of 1905.

Weight (gun and recoil band).....	pounds.....	21,931
Total length.....	inches.....	309.8
Length of bore.....	calibers.....	50
Maximum diameter, breech.....	inches.....	24
Axis of trunnions from muzzle.....	do.....	209.8
Diameter of muzzle.....	do.....	10.2
Diameter of trunnions.....	do.....	7
Length of trunnions.....	do.....	5
Distance between rimbases.....	do.....	25.7
Axis of trunnions from muzzle.....	do.....	209.8
Rifling:		
Number of grooves.....		54
Width of grooves.....	inches.....	0.2001
Depth of grooves.....	do.....	0.05
Width of lands.....	do.....	0.14
Twist.....		0 to 1 turn in 25 cali- bers.
Powder chamber (cylindrical):		
Diameter.....	inches.....	8
Length.....	do.....	43.715
Capacity.....	cubic inches.....	2,122
Total capacity of bore.....	do.....	9,457
Projectiles:		
The same as for 6-inch guns, models of 1900 and 1903.		
Travel of projectile.....	inches.....	234.075
Powder:		
Kind.....	Nitrocellulose.	
Weight (including igniter), approximate.....	pounds.....	30
Density of loading.....		0.4307
Muzzle velocity, high.....	feet per second.....	2,600
Muzzle velocity, reduced.....	do.....	1,550
Maximum pressure per square inch.....	pounds.....	30,000
Muzzle energy.....	foot-tons.....	4,143

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# **Sec. 5.—INSTRUCTIONS FOR THE CARE AND PRESERVATION OF GUNS.**

All parts of guns and breech mechanisms should be kept free from rust and dirt and well lubricated with the lubricants furnished for that purpose. To insure this condition the gun and breech mechanism when not in use should be carefully examined at least once each week.

All gas-check pads should be coated before assemblage with a mixture of graphite and No. 4½ lubricant. It would be advisable, also, to apply this coating of graphite and No. 4½ lubricant before each target practice.

As far as possible all lubricant, cosmic, etc., should be kept from electrical-contact surfaces, as a thin layer of oil will prevent proper contact. For the same reason, slushing the electrical holders containing insulating material such as vulcanite is undesirable, and must not be done, as the oil works in around this material and gradually oozes out on surface, coating the contact surfaces.

Once or twice each year the gun should be so far removed from its cradle that the interior of the cradle and the bearing part of the exterior of the gun can be thoroughly cleaned and oiled. The gun and mount should at such times be jacked up sufficiently for examining and cleaning any bearings or bearing surfaces that are at other times inaccessible.

In the case of those guns on which a zone immediately in front of the cradle has the same diameter as the interior of the cradle, this zone must be kept free from paint.

When guns are to remain unused for several months the bores should be covered with a mixture of 75 per cent petrolatum and 25 per cent resin. To prepare the mixture, melt the ingredients separately, pour them together, then boil the mixture slowly, with repeated stirrings, for one hour. As a rule this mixture can be removed from the bore sufficiently for firing by the use of the scraper alone.

After firing, the bore may be cleaned by using a sponge covered with burlap well saturated with water. The bore should then be permitted to drain and thoroughly dry before being oiled. As a rule the bright parts of the gun should not be wiped off during rainy weather, but only at such times as will insure the surfaces being dry before being reoiled.

When not in use sights should be removed from the mounts, and after being carefully oiled should be stored in a dry place. The sight brackets on the mount should be kept filled with a plug of greased tow to keep out water and dirt and should be frequently examined to prevent rusting.

Electrical attachments for night sights and firing purposes should receive care similar to that given the sights. On account of the necessarily limited energy in the batteries, and the ease with which the lights can be turned on and off, the night sights should not be kept lighted unnecessarily.

When not in use the firing-attachment slide should be removed from the gun, thoroughly cleaned, and stored in a dry place.

Before firing all electrical contacts should be examined to see that the firing circuit is perfect and that no short circuit exists. This can best be accomplished by firing a primer before the gun is loaded.

PART II.  
DESCRIPTION AND INSTRUCTIONS FOR THE CARE OF 5 AND  
6 INCH GUN CARRIAGES.

Sec. 1.—GUN.

IMPORTANT.—Each battery commander of 6-inch guns should see that two crews of men are taught to perform the following operations rapidly. They should plan for all possible conditions.

TO MOUNT (USING CHAIN HOISTS).

(Plate VII.)

Tools, etc., needed:

One 2 by 4 by 72 inch wood bar.	Wrench for piston-rod nuts.
Three crowbars.	Two 21-inch monkey wrenches.
Picks and shovels.	Two 15-inch monkey wrenches.
Two 4-ton chain hoists.	Two 12-inch monkey wrenches.
Four 4 by 6 by 30 inch wood blocks.	One assembling frame.
One 1-inch by 250-foot rope with two double blocks.	One assembling spline.
Two 1-inch by 100-foot ropes with two single blocks.	One assembling superstructure.
One 1-inch by 50-foot rope.	One tractor.
Wrench for limber connection.	One chain sling.
	Two rope slings.

PREPARATIONS FOR MOUNTING.

- (a) Assemble all tools, etc., near the carriage.
- (b) If 2 by 12 inch planks are available place two, one on top of the other, and projecting to the rear, under each carriage wheel; likewise, place two 2 by 12 inch planks side by side and projecting to the rear under the end of the trail. (See fig. 1, Pl. VII.)
- (c) Station two men at the elevating, handwheel to maneuver the cradle while the gun is being mounted, and one man on the trail at the *front* of the cradle.
- (d) Remove the rear piston and spring rod nuts. In case of the 6-inch gun, model of 1900 (B. C.), remove the spring rod yoke also.
- (e) NOTE.—The assembling spline is assumed to have remained on the gun during transport.

PROCEDURE.

1. Place the gun as follows:
  - (a) (For all guns:) Maneuver the gun into position with the tractor so that the muzzle is about in line with the entrance of the cradle. (Fig. 1, Pl. VII.) Block the wheels of the transport vehicle firmly and set the brakes.
2. Fasten the assembling spline to the gun, as follows (if not already in place):

(a) (For all guns:) Assemble the clamping bands to the spline: the large band goes on the small end of the spline. Be sure that the arrows on the bands point *toward* the muzzle. Do not fail to replace the split pins in the band hinge-pins.

(b) (Guns of model of 1903 and 1905:) Lift the spline into place (four men required) by means of two crowbars through the holes provided. (For guns of model of 1900:) Lift the spline into place (fig. 1) by means of one crowbar through the one hole provided and the 2 by 4 by 72 inch wood bar. In each of the above cases four dowels in the spline will fit into the recesses of the gun. In case of all except the model of 1900 gun, the projection on the end of the spline likewise fits into a recess in the end of the gun key.

(c) Clamp the bands about the gun. (Two men mounted on the gun required.)

### 3. Mount the gun in the cradle, as follows:

(a) (For all carriages:) Attach a tractor to the trail of the carriage by means of a rope or chain passed under the transport vehicle. To avoid any violent motion of the carriage it may be best to connect the trail to a stake 50 feet or more to the rear by means of the 1-inch double blocks and tackle, attaching the free rope to a tractor. Also drive stakes on either side of the trail, about 30 feet out and 5 feet to the rear, and attach a 1-inch block and tackle between each stake and the corresponding shackle on the end of the trail.

(b) Pass the 1-inch by 50-foot rope around the gun about 3 feet from the muzzle end (fig. 1). Relieve the brakes slightly, then pull the muzzle down and remove the limber and limber connection. Station several men at each end of the gun to assist in balancing it.

(c) Pull the gun carriage to the rear by means of the tractor, guiding the end of the trail by the two 100-foot rope tackles. As the muzzle of the gun passes through the cradle, be careful that it does not bump. When the cradle touches the rope which has been passed about the gun in rear of the muzzle, slip the rope back sufficiently far to permit the gun to project 12 inches in front of the cradle, and then transfer the rope to this portion of the gun. Continue pulling the carriage to the rear until the wheel of the transport vehicle is approximately 6 inches from the elevating handwheel (fig. 2) relocating the two side stakes to the rear of the trail to avoid interference between the rope tackles and the wheels of the transport vehicle.

(d) Maneuver the trail by means of the rope tackles until the gun spline drops easily into the splineway in the bottom of the cradle. Elevate or depress the cradle until the gun spline bears evenly in the splineway.

(e) Transfer the 250-foot rope tackle to connect the recoil band with the cradle and keep it tight. (To prevent the gun from slipping back.)

(f) Erect the assembling structure and superstructure and hook the two 4-ton chain hoists into the links provided for them on the beam of the superstructure.

(g) Pass the chain sling once and a half around the gun and connect its ends to the two hoists. With two men at each hoist raise the gun until its axis is slightly depressed toward the muzzle.

(h) Assemble the tie-rod connecting the intermediate standards of the assembling frame.

(i) Place the assembling truck upon the rails and attach it to the recoil band as follows:

(For 6-inch gun, model 1900 B. C.): See that the four spring keys on the front side of the truck are pulled out and turned 90°. Bring the truck up against the rear face of the recoil band, and lower the gun until the quarter-inch projection on the truck enters the counterbore in the rear side of the piston-rod lug. Pass the securing chains over the gun, fastening them by means of the claw and cam arrangement provided (adjusting the turnbuckles if necessary to give the proper tension in the chain) and turn the spring keys 90°, allowing them to enter their sockets. The truck is now firmly secured against either backward or forward motion relative to the gun. (For 6-inch guns, model 1900 (D. C.), 1903, and 1905:) The operation is the same except that there is no projection on the truck to engage a corresponding counterbore in the recoil band and the spring keys do not have to be pulled out and locked before attaching the truck.

(j) Remove the chain hoists and the superstructure.

(k) Draw the gun into the cradle by means of the rope tackle as far as the forward piston-rod nut will permit, taking advantage of the vertical and horizontal adjustment provided in the truck to insure accurate alignment of the gun spline in the splineway. Remove the load on the assembling truck by means of the adjusting screws thereon. Remove the rope tackle, assembling truck, and frame.

### 4. Connect the gun to the cradle, as follows:

(a) Replace the rear spring-rod nuts, drawing them up until the taper and split pins may be inserted.

(b) Run the forward spring-rod nuts back against the recoil band and insert taper and split pins.

(c) Replace and pin the rear piston-rod nuts and caps.

### 5. Remove the assembling spline.

#### TO DISMOUNT (USING CHAIN HOISTS).

Tools, etc., needed:

One 2 by 4 by 72 inch wood bar.  
Three crowbars.  
Picks and shovels.  
Two 4-ton chain hoists.  
Four 4 by 6 by 30 inch wood blocks.

One 1-inch by 250-foot rope with two double blocks.  
Two 1-inch by 100-foot ropes with single blocks.  
One 1-inch by 50-foot rope.



Wrench for limber connection.  
Wrench for piston-rod nuts.  
Two 21-inch monkey wrenches.  
Two 15-inch monkey wrenches.  
Two 12-inch monkey wrenches.  
One assembling frame.

One assembling spline.  
One assembling superstructure.  
One assembling truck.  
One tractor.  
One chain sling.  
Two rope slings.

#### PREPARATIONS FOR DISMOUNTING.

- (a) Assemble all tools, etc., near the carriage.  
(b) If 2 by 12 inch planks are available, place two, one on top of the other, projecting forward under each wheel; likewise, place two 2 by 12 inch planks, side by side, and projecting forward, under the trail. (See fig. 5, Pl. X.)

#### PROCEDURE.

1. Fasten the assembling spline to the gun as follows (set the gun in an approximately horizontal position):
  - (a) (For all guns:) Assemble the clamping bands to the spline, the large band goes on the small end of the spline. Be sure that the arrows on the bands point toward the muzzle. Do not fail to replace the split pins in the band hinge-pins.
  - (b) (Guns model of 1903 and 1905:) Lift the spline into place (four men required) by means of two crowbars through the holes provided. (For guns model of 1900:) Lift the spline into place by means of one crowbar through the one hole provided and the 2 by 4 by 72 inch wood bar. In each of the above cases, four dowels in the spline will fit into recesses in the gun. With the exception of the 1900 B. C. gun, the projection on the end of the spline likewise fits into a recess in the end of the gun key.
  - (c) Clamp the bands about the gun. (Two men mounted on the gun required.)

2. Release the gun from the cradle, as follows (Pl. IX):

- (a) (For all 6-inch guns:) Remove the rear piston-rod nut (25) and run the front spring rod nuts (14) forward tight against their respective cylinder heads to prevent releasing of the springs. Remove the rear spring rod nuts. In case of the 6-inch guns, model of 1900 B. C., remove the spring rod yoke also.

3. Remove the gun from the cradle, as follows:

- (a) (For all 6-inch guns:) Bring up the transport wagon astride the trail until the wheels barely touch the elevating handwheel. Set the brakes and remove the locking key nearest the carriage.
- (b) Erect the assembling frame complete, except the assembling superstructure.

- (c) Attach the assembling truck to the recoil band and by means of the adjusting screws cause the weight of the rear portion of the gun to be carried evenly by the wheels of the truck.

- (d) By means of a stake 20 or 30 feet in rear of the trail and the 150-foot rope tackle draw the gun out of the cradle until the wheels of the assembling truck touch the stops on the ends of the rails.

- (e) Erect the assembling superstructure and hook the two 4-ton chain hoists into the links provided for them on the beam of the superstructure.

- (f) Pass the chain sling once and a half around the gun and connect its ends to the two hoists. Disconnect the securing chains on the assembling truck. With two men at each hoist, raise the gun slightly and remove the truck.

- (g) Attach one of the rope slings to the cradle and one to the recoil band and connect them with the 250-foot rope tackle, securing its free end after pulling it taut.

- (h) Station two men at the elevating handwheel to maneuver the cradle while the gun is being lowered.

- (i) Lower the gun onto the transport wagon making sure that the rear end of the spline on the gun enters the spline recess in the transport wagon a little ahead of the lower locking key.

- (j) Ease off on the rope tackle, allowing the gun to move rearward until the rear end of the spline bears against the lower locking key and secure the gun to the transport wagon.

- (k) Remove the chain hoists, assembling superstructure, frame, and rope tackle.

- (l) By means of the 250-foot rope tackle, connect the front of the cradle with a stake about 50 feet forward and attach the free end to a tractor. Sling a rope about the muzzle of the gun to guide it through the cradle.

- (m) Pull the carriage forward until the gun is free (fig. 1). Depress the gun and attach the limber.

4. Replace and pin the rear piston and spring rod nuts.

5. Lock the cradle to the trail by means of the traveling lock.

#### TO MOUNT (USING LEVER JACKS).

#### Tools, etc., needed:

One 2 by 4 by 72 inch wood bar.  
Three crowbars.  
Picks and shovels.  
Two lever jacks.  
Four 4 by 6 by 30 inch wood blocks.  
One 1-inch by 250-foot rope with two double blocks.  
Two 1-inch by 100-foot ropes with two single blocks.  
One 1-inch by 50-foot rope.

Wrench for limber connection.  
Wrench for piston-rod nuts.  
Two 21-inch monkey wrenches.  
Two 15-inch monkey wrenches.  
Two 12-inch monkey wrenches.  
One assembling frame.  
One assembling spline.  
One assembling truck.  
One tractor.  
Two rope slings.

## PREPARATIONS FOR MOUNTING.

- (a) Assemble all tools, etc., near the carriage.
- (b) If 2 by 12 inch planks are available place two, one on top of the other, and projecting to the rear, under each carriage wheel; likewise, place two 2 by 12 inch planks side by side and projecting to the rear under the end of the trail. (See fig. 1, Pl. VII.)
- (c) Station two men at the elevating handwheel to maneuver the cradle while the gun is being mounted, and one man on the trail at the front of the cradle.
- (d) Remove the rear piston and spring rod nuts. In case of the 6-inch gun, model of 1900 (B. C.), remove the spring rod yoke also.
- (e) Note: The assembling spline is assumed to have remained on the gun during transport.

## PROCEDURE.

## 1. Place the gun as follows:

(a) (For all guns:) Maneuver the gun into position with the tractor so that the muzzle is about in line with the entrance of the cradle. (Fig. 1, Pl. VII.) Block the wheels of the transport vehicle firmly and set the brakes.

2. Fasten the assembling spline to the gun, as follows (if not already in place):

(a) (For all guns:) Assemble the clamping bands to the spline: the large band goes on the small end of the spline. Be sure that the arrows on the bands point *toward* the muzzle. Do not fail to replace the split pins in the band hinge-pins.

(b) (Guns of model of 1903 and 1905:) Lift the spline into place (four men required) by means of two crowbars through the holes provided. (For guns of model of 1900:) Lift the spline into place (fig. 1) by means of one crowbar through the one hole provided and the 2 by 4 by 72 inch wood bar. In each of the above cases four dowels in the spline will fit into the recesses of the gun. In case of all except the model of 1900 gun, the projection on the end of the spline likewise fits into a recess in the end of the gun key.

(c) Clamp the bands about the gun. (Two men mounted on the gun required.)

## 3. Mount the gun in the cradle, as follows:

(a) (For all carriages:) Attach a tractor to the trail of the carriage by means of a rope or chain passed under the transport vehicle. To avoid any violent motion of the carriage it may be best to connect the trail to a stake 50 feet or more to the rear by means of the 1-inch double blocks and tackle, attaching the free rope to a tractor. Also drive stakes on either side of the trail, about 30 feet out and 5 feet to the rear, and attach a 1-inch block and tackle between each stake and the corresponding shackle on the end of the trail.

(b) Pass the 1-inch by 50-foot rope around the gun about 3 feet from the muzzle end (fig. 1). Relieve the brakes slightly, then pull the muzzle down and remove the limber and limber connection. Station several men at each end of the gun to assist in balancing it.

(c) Pull the gun carriage to the rear by means of the tractor, guiding the end of the trail by the two 100-foot rope tackles. As the muzzle of the gun passes through the cradle be careful that it does not bump. When the cradle touches the rope which has been passed about the gun in rear of the muzzle, slip the rope back sufficiently far to permit the gun to project 12 inches in front of the cradle, then transfer the rope to this portion of the gun. Continue pulling the carriage to the rear until the wheel of the transport wagon is approximately 6 inches from the elevated handwheel (fig. 2), re-locating the two side stakes to the rear of the trail to avoid interference between the rope tackles and the wheels of the transport vehicle.

(d) Maneuver the trail by means of the rope tackles until the gun spline drops easily into the splineway in the bottom of the cradle. Elevate or depress the cradle until the gun spline bears evenly in the splineway.

(e) Transfer the 250-foot rope tackle to connect the recoil band with the cradle, and keep it tight. (To prevent the gun from slipping back.)

(f) Attach the assembling truck to the recoil band as follows:

(For 6-inch gun, model of 1900:) See that the four spring keys on the front side of the truck are pulled out and turned 90°. Bring the truck up against the rear face of the recoil band, making sure that the quarter-inch projection on the truck enters the counterbore in the rear side of the piston rod lug. Pass the securing chains over the gun, fastening them as quickly as possible by means of the claw and cam arrangement provided (adjusting the turnbuckles if necessary to give the proper tension in the chain) and turn the spring keys 90°, allowing them to enter their sockets. The truck is now firmly secured against either backward or forward motion relative to the gun. (For 6-inch guns, models 1900 D. C., 1903 and 1905:) The operation is the same except that there is no projection on the truck to engage a corresponding counterbore in the recoil band and the spring keys do not have to be pulled out and locked before attaching the truck.

(g) (For all guns:) Set the two lever jacks on firm foundations in such positions that they will lift on the flat portion of the underside of the assembling truck.

(h) Raise the gun by means of these jacks until the axis of the gun is slightly depressed toward the muzzle.

(i) Erect the assembling frame, attaching the two horizontal rails only after the completion of the previous operation, securing the tie-rod as soon as the position of the gun will permit.

(j) Lower the gun and truck onto the rails, remove the jacks and the blocking.

(k) Draw the gun into the cradle by means of the rope tackle as far as the forward piston-rod nut will permit, taking advantage of the vertical and horizontal adjustment provided in the truck to insure accurate alignment of the gun spline in the splineway. Remove the load on the assembling truck by means of the adjusting screws thereon. Remove the rope tackle, assembling truck, and frame.

4. Connect the gun to the cradle, as follows:

(a) Replace the rear spring-rod nuts, drawing them up until the taper and split pins may be inserted.

(b) Run the forward spring-rod nuts back against the recoil band and insert taper and split pins.

(c) Replace and pin the rear piston-rod nuts and caps.

5. Remove the assembling spline.

#### TO DISMOUNT (USING LEVER JACKS).

##### Tools, etc., needed:

One 2 by 4 by 72 inch wood bar.	Wrench for limber connections.
Three crowbars.	Wrench for piston-rod nuts.
Picks and shovels.	Two 21-inch monkey wrenches.
Two lever jacks.	Two 15-inch monkey wrenches.
Two 4 by 6 by 30 inch wood blocks.	Two 12-inch monkey wrenches.
Thirty 6 by 6 by 24 inch wood blocks.	One assembling frame.
One 1-inch by 250-foot rope with two double blocks.	One assembling spline.
Two 1-inch by 100-foot ropes with single blocks.	One assembling truck.
One 1-inch by 50-foot rope.	One tractor.
	Two rope slings.

#### PREPARATIONS FOR DISMOUNTING.

(a) Assemble all tools, etc., near the carriage.

(b) If 2 by 12 inch planks are available, place two, one on top of the other, projecting forward under each wheel; likewise, place two 2 by 12 inch planks, side by side, and projecting forward, under the trail. (See fig. 5, Pl. X.)

#### PROCEDURE.

1. Fasten the assembling spline to the gun, as follows (set the gun in an approximately horizontal position):

(a) (For all guns:) Assemble the clamping bands to the spline; the large band goes on the small end of the spline. Be sure that the arrows on the bands point toward the muzzle. Do not fail to replace the split pins in the band hinge pins.

(b) (Guns of model of 1903 and 1905:) Lift the spline into place (four men required) by means of two crowbars through the holes provided.

(For guns of model of 1900:) Lift the spline into place by means of one crowbar through the one hole provided and the 2 by 4 by 72 inch wood bar. In each of the above cases four dowels in the spline will fit into recesses in the gun. With the exception of the 1900 B. C. gun, the projection on the end of the spline likewise fits into a recess in the end of the gun key.

(c) Clamp the band about the gun. (Two men mounted on the gun required.)

2. Release the gun from the cradle, as follows (Pl. IX):

(a) (For all 6-inch guns:) Remove the rear piston-rod nut (25) and run the front spring-rod nuts (14) forward tight against their respective cylinder heads to prevent releasing of the springs. Remove the rear spring-rod nuts. In case of the 6-inch guns, model 1900 B. C., remove the spring-rod yoke also.

3. Remove the gun from the cradle, as follows:

(a) (For all 6-inch guns:) Bring up the transport wagon astride the trail until the wheels barely touch the elevating handwheel. Set the brakes.

(b) Erect the assembling frame complete, but not the assembling superstructure.

(c) Attach the assembling truck to the recoil band and by means of the adjusting screws cause the weight of the rear portion of the gun to be carried evenly by the wheels of the truck.

(d) By means of a stake 20 or 30 feet in rear of the trail and the 150-foot rope tackle draw the gun out of the cradle until the wheels of the assembling truck touch the stops on the ends of the rails.

(e) Station two men at the elevating handwheel. Put blocking and lever jacks in position, attach the 250-foot-rope tackle to the cradle and recoil band, jack up the gun to relieve the load on the assembling frame, remove the assembling frame, and lower the gun on to the transport vehicle. Keep the block and tackle tight and elevate the cradle as the breech end of the gun is lowered.

(f) Secure the gun to the transport wagon, remove the assembling truck, and attach the limber connection.

(g) Connect the front of the cradle with a stake about 50 feet forward and attach the free rope to a tractor. Sling a rope about the muzzle of the gun to guide it in the cradle.

(h) Pull the carriage forward until the gun is free (fig. 1). Depress the gun and attach the limber.

4. Replace and pin the rear piston and spring rod nuts.

5. Lock the cradle to the trail by means of the traveling lock.

## Sec. 2.—CARRIAGE.

## 2A.—COUNTER RECOIL MECHANISM.

## LIST OF PARTS.

(Plate VIII.)

5-inch gun carriage, model of 1917.

## UPPER SPRINGS.

No.	Name.	Piece mark.	Material.
1	Piston.....	3-49-9A.....	Steel.
3	Spring rod (upper).....	3-49-9C.....	Forged steel.
4	Spring cylinder.....	3-49-9H.....	Steel.
5	Counterrecoil spring (upper).....	3-49-9B.....	Spring steel.
7	Bushing.....	3-49-9E.....	Bronze.
8	Separator (upper).....	3-49-9F.....	Cast steel
11	Cylinder head (rear).....	3-49-9G.....	I o.
14	Spring-rod nut.....	3-49-9.....	Bronze No. 3.
16	Spring-rod nut and guard (upper).....	3-49-9K and 9L.	Steel.
13-18	Split pins. Taper pins.		

## LOWER SPRINGS.

3	Spring rod (lower).....	3-49-7E.....	Forged steel No. 2.
5	Counterrecoil spring (outer).....	3-49-7R.....	Spring steel.
6	Counterrecoil spring (inner).....	3-49-7S.....	o.
8	Spring separator (lower).....	3-49-7L.....	Bronze.
10	Modified cradle.....	3-49-6A.....	Bronze No. 3.
14	Nut.....	3-49-7F.....	Steel.
15	Recoil band.....		o.
16	Spring-rod nut and guard.....	3-49-7G and 7M.	Do.
13-18	Split pins. Taper pins.		

6-inch gun carriage, model of 1917, type A.

## UPPER SPRINGS.

No.	Name.	Piece mark.	Material.
1	Spring-rod piston.....	3-54-7A.....	Steel.
3	Spring rod.....	3-54-7.....	Forged steel No. 2.
4	Spring cylinder.....	3-54-7E.....	Steel.
5	Spring (upper).....	3-54-7G.....	Spring steel.
8	Spring separator.....	3-54-7B.....	Forged steel.
10	Modified cradle.....	3-54-5C.....	Cast steel No. 2.
11	Follower.....	3-54-7L.....	Bronze No. 3.
14	Spring-compressor nut.....	3-54-7P.....	I o.
15	Spring-rod bracket.....	3-54-7H.....	Cast steel No. 2.
16-22	Nut.....	3-54-7Q and 7T	Forged steel.
21	Spring cylinder head.....	3-54-7F.....	Cast steel.
13-18	Split pins. Taper pins.		

## LOWER SPRINGS.

1	Spring-rod head.....	7-9-22LA.....	Forged steel.
1A	Head (front).....	7-9-22G.....	Bronze No. 3.
3	Spring rod.....	7-9-22C.....	Forged steel No. 3.
4	Spring-case extension (front).....	3-54-8A.....	Steel.
4A	Stirrup.....	7-9-22F.....	I o.
4B	Spring-case extension (rear).....	7-9-22H.....	I o.
5	Counterrecoil spring (outer).....	7-9-22A.....	Spring steel.
6	Counterrecoil spring (inner).....	7-9-22B.....	I o.
8	Spring separator (small).....	7-9-22E.....	Steel.
8A	Spring separator (large).....	7-9-22E.....	I o.
10	Modified cradle.....	3-54-5C.....	Cast steel No. 2.
11	Head (large).....	7-9-22G.....	Bronze No. 3.
11A	Head (small).....	7-9-22G.....	o.
14	Spring-rod nut.....	7-9-22.....	Steel.
15	Spring-rod yoke.....	7-9-22B.....	Forged steel No. 2.
16	Spring-rod nut and guard.....	7-9-22K and 22L.	Steel.
13-18	Split pins. Taper pins.		

6-inch gun carriage, model of 1917.

No.	Name.	Piece mark.	Material.
1	Spring-rod piston.....	3-50-12B.....	Cast steel.
2	Pins (0.375 by 3.75).....	3-50-12.....	Steel.
3	Spring rod.....	3-50-12A.....	Forged steel No. 3.
4	Spring cylinder.....	3-50-11C.....	Wrought iron.
5	Counterrecoil spring (outer).....	3-50-12F.....	Spring steel.
6	Counterrecoil spring (inner).....	3-50-12G.....	Do.
7	Spring-separator bushing.....	3-50-12H.....	Bronze.
8	Spring separator.....	3-50-12C.....	Cast steel.
9	Pins (0.375 by 4.25).....	3-50-12.....	Steel.
10	Cradle.....	3-50-8A.....	Cast steel No. 1.
11	Spring head.....	3-50-12K.....	Bronze.
12-17	Split pin (0.125 by 0.75).....	3-50-12.....	Steel.
13-18	Taper pin.....	3-50-12E.....	Do.
14-16	Spring-rod nut.....	3-50-12J.....	Forged steel No. 3.
15	Recoil band.....		Steel.
19	Spring-rod extension.....	3-50-50A.....	Forged steel.
20	Extension eye.....	3-50-50B.....	Do.

## TO ASSEMBLE.

For cradles, model of 1917. (Fig. 1, Pl. VIII.)

## Tools, etc., needed:

One 4-ton chain block.

One spring-rod extension.

One spring-rod extension eye.

Wrench (U43NA).

Hammers from trail chest.

Four men.

## PROCEDURE.

1. Elevate the muzzle of the gun until the springs will clear the brake transom when they are being removed.

2. Assemble the outer and inner springs (5 and 6) and the spring separators (8) in order on the spring rod. See that the recess in the spring separator is filled with graphite grease. Enter the spring rod, springs, etc., into the cylinder as far as the springs will permit.

3. Compress the springs, as follows:

(a) Screw the extension eye (20) onto the spring-rod extension (19), and attach the extension to the spring rod as shown in figure 1.

(b) Attach the upper duplex block hook to the extension eye, and the lower hook to the shackle on the limber connection at the end of the cradle. Draw the spring rod back until the forward spring-rod nut (14) is advanced and pinned in its proper place by pins (12 and 13). Run the rear spring-rod nut (16) forward against the recoil band and pin it in place by pins (17 and 18).

For cradles, model of 1917, type A. (Fig. 2, Pl. VIII.)

## Lower springs.—Tools, etc., needed:

21-inch monkey wrench from trail chest. | Three men.

## PROCEDURE.

1. Assemble the mechanism, as follows:

(a) Elevate the cradle until the springs will clear the brake transom on entering the lower spring cylinders.

(b) Assemble the springs (5 and 6), spring separators (8 and 8A) and inner spring cylinder (4A) on the spring rod (3), as shown in figure 2, Plate VIII.

(c) Place the spring rod, springs, etc., in the cylinder and draw the rod up by means of the rear spring-rod nut (16) until the rearmost taper pin hole in the rod coincides with that in the nut; pin with pins (17) and (18).

(d) Screw up the front spring-rod nut (14) against the spring-rod yoke (15) and pin in place with pin (12) and (13). The front face of the lower spring-rod piston should now be 1.875 inches from the front end of the spring cylinder.

*Upper springs.*—Tools, etc., needed:

21-inch monkey wrench from trail chest.	Three men.
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## PROCEDURE.

1. Assemble the mechanism, as follows:

(a) Assemble the springs (5) and spring separator (8) on the spring rod (3).

(b) Enter the spring rod, springs, etc., into the cylinder and screw on the forward nut (14). Hold the spring rods by means of a wrench at the rear end and compress the springs by means of nut (14) until the rearmost taper pin hole in the rod coincides with that in the nut; pin with pins (17) and (18).

(c) Screw up the front spring-rod nut (14) against the spring-rod bracket (15) on the recoil band and pin in place with pins (12) and (13). The front face of the lower spring-rod piston should now be 0.5 inch from the front end of the spring cylinder.

*For 5-inch cradles, model of 1897.* (Fig. 3, Pl. VIII.)

*Lower springs.*—Tools, etc., needed:

21-inch monkey wrench from trail chest.	Three men.
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## PROCEDURE.

1. Assemble the mechanism, as follows:

(a) Elevate the cradle until the springs will clear the brake transom on entering the lower spring cylinders.

(b) Assemble the springs (5 and 6) and separators (8) on the spring rod (3).

(c) Place the spring rod, springs, etc., in the cylinder and draw the rod up by means of the rear spring-rod nut, and compress the springs by means of the rear nut (16) until the rearmost taper pin hole in the rod coincides with that in the nut; pin with pins (17) and (18).

(d) Screw up the front spring rod nut (14) against the recoil band (15) and pin in place with pins (12) and (13). The front face of the lower spring-rod piston should now be 1 inch from the front end of the lower spring cylinder.

*Upper springs.*—Tools, etc., needed:

21-inch monkey wrench from trail chest.	Three men.
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## PROCEDURE.

1. Assemble the mechanism, as follows:

(a) Assemble the springs (5) and separator (8) on the spring rod (3).

(b) Enter the spring rod, springs, etc., into the cylinder and compress the springs by means of the rear nut (16) until the rearmost taper pin hole in the rod coincides with that in the nut; pin with pins (17) and (18).

(c) Screw up the front spring rod nut (14) against the spring rod bracket (15) on the recoil band and pin in place with pins (12) and (13). The front face of the upper spring-rod piston should now be 0.5 inch from the front end of the spring cylinder.

## TO DISASSEMBLE.

*For cradles, model of 1917.* (Fig. 1, Pl. VIII.)

Tools, etc., needed:

One 4-ton chain block.	Wrench (U43NA).
One spring-rod extension.	Hammers from trail chest.
One spring-rod extension eye.	Three men.

## PROCEDURE.

1. Elevate the muzzle of the gun until the springs will clear the brake transom when they are being removed.

2. Release the springs, as follows:

(a) Remove the split and taper pins from front and rear spring-rod nuts.

(b) Screw the extension eye on to the extension rod and the extension rod into the end of the spring rod.



(c) Attach the upper duplex block hook to the eye and the lower hook to the shackle on the limber connection at the end of the trail. Draw the block up tight.

(d) Remove the rear spring-rod nut and ease off on the chain block; back off the front spring-rod nuts as the spring rod advances.

(e) When the spring compression is released, unhook the block, remove the spring-rod extension, and withdraw the spring rod and springs from the cylinder.

*For cradles, model of 1917, Type A. (Fig. 2, Pl. VIII.)*

*Upper springs.*—Tools, etc., needed:

21-inch monkey wrench from trail chest. | Three men.

#### PROCEDURE.

1. Release the springs, as follows:

(a) Remove the split and taper pins from the front and rear spring-rod nuts.

(b) Run the forward spring-rod nut forward tight against the cylinder head.

(c) Release and remove the rear spring-rod nut.

(d) Back off the forward spring-rod nut until the spring rod, springs, etc., may be removed from the cylinder.

*Lower springs.*—Tools, etc., needed:

21-inch monkey wrench from trail chest. | Three men.

#### PROCEDURE.

1. Elevate the muzzle of the gun until the springs will clear the brake transom when they are being removed.

2. Release the springs, as follows:

(a) Remove the split and taper pins from the front and rear spring-rod nuts.

(b) Back off both nuts until the springs are released.

*For 5-inch cradles, model of 1897. (Fig. 3, Pl. VIII.)*

*Upper and lower springs.*—Tools, etc., needed:

21-inch monkey wrench from trail chest. | Three men.

#### PROCEDURE.

1. Release the springs, as follows:

(a) Remove the split and taper pins from the front and rear spring-rod nuts.

(b) Back off both nuts until the springs are released.

NOTE.—Before removing the lower springs elevate the muzzle of the gun until the springs will clear the brake transom.

#### TO PROVIDE FOR INCREASED ELEVATION OF GUNS.

*For 6-inch carriage, model of 1917.*

To provide for an increase in the elevation of the gun from 40° to 60°, draw up the spring rod 3.75 inches.

*For 6-inch carriage, model of 1917, type A.*

To provide for an increase in the elevation of the gun from 40° to 60°, draw up the lower spring rods 1.5 inches. *It is not necessary to draw up the upper spring rods.*

*For 5-inch carriage, model of 1917.*

To provide for an increase in the elevation of the gun from 40° to 54°, draw up the lower spring rods 0.5 inch. *It is not necessary to draw up the upper spring rods.*

In each of the above cases it will be necessary to lower the trail of the carriage approximately 5 feet in the ground.

#### 2B.—RECOIL MECHANISM.

##### LIST OF PARTS.

(Plate IX.)

*5-inch gun carriage, model of 1917.*

No.	Name.	Piece mark.	Material.
1	Counter-recoil buffer nut.....	3-49-7N.....	Bronze No. 3.
2	Counter-recoil buffer.....	3-49-7H.....	Do.
6	Modified cradle.....	3-49-6A.....	Do.
7	Piston rod.....	3-49-7B.....	Forged steel No. 3.
8	Liner.....	3-49-7A.....	Bronze No. 3.
9	Recoil fluid (1.45 gallons).....		Hydrolene oil.
11	Stuffing box.....	3-49-7C.....	Bronze No. 3.
12	Packing (2 rings).....	3-49-7T.....	Garlock's hydraulic.
21	Stuffing-box nut.....	3-49-7D.....	Bronze No. 3.
24	Recoil band.....		Steel.
25-29	Piston-rod nuts.....	6-4-4.....	Do.

*6-inch gun carriage, model of 1917, type A.*

No.	Name.	Piece mark.	Material.
1	Front cylinder head.....	3-54-8C.....	Forged steel No. 3.
2	Counter-recoil plunger.....	3-54-8B.....	Tol in bronze.
3	Gasket.....	3-54-8D.....	Annealed copper.
4	Piston liner.....	7-9-22T.....	Bronze No. 4.
5-8	Liner (recoil cylinder modified).....	3-54-5: 22U.....	Forged steel No. 2.
6	Modified cradle.....	3-54-5C.....	Cast steel No. 2.
7	Piston rod (modified).....	3-54-5: 22X.....	Forged steel No. 3.
9	Recoil fluid (2.82 gallons).....		Hydrolene oil.
10	Bushing.....	7-9-22FA.....	Bronze No. 3.
11	Rear cylinder head.....	7-9-22D.....	Steel.
12	Packing (5 rings).....	7-9-22CA.....	Garlock's hydraulic.
13	Gasket.....	7-9-22W.....	Copper.
14-16	Plug.....	7-9-22BA.....	Steel.
15-17	Gasket.....	7-9-5F.....	Vulcanized fiber.
18	Gland.....	7-9-22HA.....	Steel.
19	Gland spring.....	7-9-22KA.....	Spring steel.
20	Follower.....	7-9-22EA.....	Bronze No. 3.
21-25	Nut.....	7-9-22Z.....	Steel.
24	Recoil band.....		Do.
22-26	Split pins.....		Do.
23-27	Taper pins.....	3-54-8E.....	Do.

## 6-inch gun carriage, model of 1917.

No.	Name.	Piece mark.	Material.
1	Front recoil cylinder head.....	3-50-9A.....	Bronze No. 4.
3	Gasket (front cylinder head).....	3-50-9B.....	Annealed copper.
4	Piston liner.....	3-50-9C.....	Bronze No. 3.
6	Cradle.....	3-50-8A.....	Cast steel No. 1.
7	Piston rod.....	3-50-9D.....	Forged steel "A."
8	Recoil cylinder.....	3-50-9E.....	Forged steel No. 3.
9	Recoil fluid (4½ gallons).....		Hydrolene oil.
11	Rear recoil cylinder head.....	3-50-10D.....	Forged steel No. 2.
12	Packing (5 rings).....	3-50-10F.....	Garlock's 0.75-inch.
13	Gasket (rear cylinder head).....	3-50-10E.....	Annealed copper.
14	Filling plug.....	3-50-10G.....	Steel.
15	Gasket (filling plug).....	3-50-10H.....	Vulcanized fiber.
16	Drain plug.....	3-50-10P.....	Steel.
17	Gasket (drain plug).....	3-50-10H.....	Vulcanized fiber.
18	Gland (in halves).....	3-50-10B.....	Steel.
19	Wire gland spring.....	3-50-10C.....	Spring steel.
20	Follower.....	3-50-10A.....	Bronze.
21-25	Piston-rod nuts.....	3-50-10M.....	Forged steel No. 3.
22-26	Split pins (0.125 by 0.75).....	3-50-10N.....	Steel.
23-27	Taper pins.....	3-50-10N.....	Do.
24	Recoil band.....		Forged steel.
28	Piston-rod cap.....	3-50-9F.....	Bronze.

## TO FILL THE RECOIL CYLINDER.

For all carriages.—Tools, etc., needed:

Small wrench for filling plug.	Hydrolene oil.
Funnel.	

## PROCEDURE.

1. Set the gun in a horizontal position and remove the filling plug (14) (figs. 1, 2, and 3, Pl. IX).
2. Fill the cylinder, permitting the air to escape, until the oil reaches the top of the filling hole. Replace the plug, drawing it up tight.
3. The capacity of the cylinders is as follows: 6-inch, model of 1917, type A, 2.82 gallons; 6-inch, model of 1917, 4.25 gallons; 5-inch, model of 1917, 1.45 gallons.

## TO CLEAN THE RECOIL CYLINDERS.

For all carriages.—Tools, etc., needed:

Wrench for filling and drain plugs.	Wrench for rear piston head.
Plumber's hand force pump.	
1-inch by 50-foot rope.	
Wrench for follower.	
	21-inch monkey wrench for spring-rod nut.

## PROCEDURE.

1. Elevate the gun about 10°. Remove the filling and drain plugs and permit all of the oil to drain out of the cylinder.
2. Fasten the 1-inch rope to the recoil band and pass it about the trunnion-bearing support in such a manner as will permit it to be

relieved as desired. Release the spring rods from the recoil band as explained under 2A.

3. Place the gun at 5° elevation, block up between the cradle and the trail, and remove the rear piston-rod nut. Slack off the rope, permitting the gun to slide to the rear about 24 inches.

4. Relieve the pressure on the packing by unscrewing the follower several turns and unscrew the rear cylinder head and pull it with the piston to the rear until it is possible to work on the interior of the cylinder.

5. Thoroughly clean the cylinder with kerosene oil forced into its rear end with a hand pump, then wipe the interior dry with clean cotton waste. It will not be possible to remove the counterrecoil buffer.

6. Move the piston forward as far as possible and screw the rear cylinder head tight into place. Draw up the follower (20) and fill the cylinders with oil; set the gun in a horizontal position and draw it forward, using a block and tackle between the cradle and recoil band if necessary. Attach the spring and piston rods to the recoil lugs as previously directed.

## TO PACK THE STUFFING BOX.

For all carriages.—Tools, etc., needed:

Several rings of Garlock's packing.	Several sticks of pine.
One wood mallet.	
	Wrench for follower.

## PROCEDURE.

1. To pack a stuffing box, after drawing the oil from the cylinder, remove the gland and all the packing in the box. Examine the old packing and discard any unfit for use. If any of the old packing be used, it should be put in after the new.

2. To repack, put on the piston rod one ring of 0.75-inch Garlock's waterproof hydraulic packing and force it well to the bottom of the stuffing box by a wooden stick and mallet. Treat each layer of packing in a similar manner, being careful to break joints, until five rings of new packing have been inserted, or an equal amount of new and old when any of the latter is used. Screw the gland in the box and set up tight. *No more force than that of one man should be used to tighten up the gland.* The addition of a pipe to the end of the wrench should not be permitted. The gland should be tightened from time to time. If the gland be screwed into the stuffing box too tightly, an unnecessary amount of friction will be produced on the rod. When the gland is screwed in till the flange strikes the box, another ring of packing should be inserted. It is

expected that a slight amount of oil will soak through and drip from the boxes of carriages when not in use. This should be caught and not permitted to render the carriages unsightly. Also, when tightening the glands, a slight amount of oil will be squeezed out of the saturated packing.

## 2C.—ELEVATING MECHANISM.

### LIST OF PARTS.

(Plate X.)

No.	Name.	Piece mark.	Material.
1	Handwheel.....	D39E.....	Cast steel.
2-4	Pinion.....	D29H.....	Forged steel No. 2.
3	Bevel-gear bracket cap.....	D30A.....	Cast steel.
5	Bevel-gear bracket cover.....	D30C.....	Sheet brass or sheet steel.
6	Gear.....	D23A.....	Bronze No. 4.
7	Bevel-gear bracket.....	D30E.....	Cast steel.
8	Worm shaft.....	D23C.....	Forged steel No. 2.
9	Worm.....	D31L.....	Do.
10	Worm wheel.....	D31G.....	Bronze No. 4.
11	Oil tube.....	D19G.....	Copper.
12	Friction disks.....	D31E.....	Bronze.
		D31F.....	Steel.
13	Belleville spring.....	D31H.....	Forged steel.
14	Nut.....	D31D.....	Forged steel No. 2.
15	Worm wheel and pinion bracket.....	D32A.....	Bronze No. 3.
16	Worm-wheel cover.....	D32B.....	Sheet brass.
	Bracket (6-inch, model of 1917).....	3-50-33A.....	
	Bracket (6-inch, model of 1917, type A).....	D19A.....	Bronze No. 3.
	Bracket (5-inch, model of 1917).....	D19B.....	
	Spindle (6-inch, model of 1917).....	D31A.....	
17	Spindle (6-inch, model of 1917, type A).....	D21B.....	Forged steel No. 2.
	Spindle (5-inch, model of 1917).....	D21A.....	
	Elevating pinion (6-inch, model of 1917).....	3-50-31B.....	Do.
	Elevating pinion (6-inch, model of 1917, type A).....	D21F.....	Do.
18	Elevating pinion (5-inch, model of 1917).....	D21E.....	
	Elevating gear bracket (6-inch, model of 1917).....	3-50-26A.....	
19	Elevating gear bracket (6-inch, model of 1917, type A).....	3-54-15A.....	Cast steel.
	Elevating gear bracket (5-inch, model of 1917).....	3-49-20A.....	
	Trail (6-inch, model of 1917, and 6-inch, model of 1917, type A).....	15-3K-27.....	Steel.
20	Trail (5-inch, model of 1917).....	3-49-21.....	
	Elevating rack (6-inch, model of 1917).....	3-50-31A.....	Forged steel No. 2.
21	Elevating rack (6-inch, model of 1917, type A).....	3-54-11A.....	Cast steel No. 2.
	Elevating rack (5-inch, model of 1917).....	3-49-14A.....	

### TO DISASSEMBLE. (Pl. X.)

*For all carriages.*—Tools, etc., needed:

21-inch monkey wrench.	Mallet.
Large screw driver.	Stick of oak 2 by 2 by 12 inches.
Copper hammer.	

#### PROCEDURE.

1. Elevate the gun and lock the cradle to the trail by means of the locking pin through the lower end of the elevating rack (Pl. XV).
2. Disassemble the mechanism as follows:
  - (a) Release nut (14) several turns.
  - (b) Remove housing cap (3), housing cover (5), and handwheel, shaft, and pinion (1, 2, and 4).

(c) Remove the screw and collar and beveled gear (6) from the top of the worm shaft.

(d) Remove the nut and collar from the bottom of the worm shaft and drive shaft (8) up out of the worm (9), using the wood bar.

(e) Remove the worm cover plate and worm (19).

(f) Remove nut (14), worm wheel, housing cover (15), Belleville spring (13), friction disk cover, and friction disks (12) and worm wheel (10).

(g) Remove the screw from the pinion end of the pinion shaft and drive out the pinion shaft (17), using the wood bar.

### TO ASSEMBLE. (Pl. X.)

*For all carriages.*—Tools, etc., needed:

21-inch monkey wrench.	Mallet.
Large screw driver.	Stick of oak 2 by 2 by 12 inches.
Copper hammer.	

#### PROCEDURE.

1. Assemble the parts as follows:

(a) Insert the pinion shaft (17) into the hub of the worm-wheel housing (16); drive on the elevating pinion (18) and insert the retaining screw in the pinion end of the shaft.

(b) Slip the worm wheel (10) over the pinion shaft (17), assemble the friction disks (a and b) alternately within the worm wheel, placing the friction-disk cover and Belleville spring (13) against the last disk. Replace the worm-wheel housing cover (15) and screw on nut (14).

(c) Place worm (9) in the worm housing. Insert the worm shaft (8) from the top, driving it down if necessary with the copper hammer or mallet, and assemble the collar and nut on the lower end. Replace the worm housing cover.

(d) Slip the bevel gear (6) over the top of the worm shaft (8) and replace the cap and screw. Set the handwheel, pinions, shaft and pinion (1, 2, and 4) in the housing. Replace the housing cover (5) and housing cap (3).

### TO ADJUST. (Pl. X.)

*For all carriages.*—Tools, etc., needed:

21-inch monkey wrench.	Two men.
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#### PROCEDURE.

1. Set the friction disks for the proper degree of friction as follows:

(a) With the cradle locked to the trail by means of the locking pin through the lower end of the elevating rack, draw up nut (14) until two men are barely able to turn the handle.

## 2D.—CARRIAGE WHEEL HUB.

## LIST OF PARTS.

(Plate XI.)

No.	Name.	Piece mark.	Material.
1	Linchpin tie.....	PB23D.....	Latigo leather.
2	Linchpin.....	PB23C.....	Steel.
3	Drag washer.....	PB23E.....	Do.
4	Collar (outer).....	PB23A.....	Do.
5	Outer collar bolt.....	PB23B.....	Do.
6	Filler piece.....	PB23K.....	Do.
7-14	Mud guard.....	PB23G.....	Do.
8-15	Countersunk head screw.....	PB23M.....	Do.
9	Bushing.....	D36B1.....	Bronze No. 3.
10	Pin (0.375 by 2.25).....	15-3K-36.....	Bronze.
11	Wheel.....	D36A.....	Cast steel.
12	Grease-cup connection.....	D36C.....	Steel.
13	Grease cup.....	Commercial.....	Do.
16	Inner collar.....	D34D.....	Forged steel.
17	Axle.....	D34A.....	Forged steel No. 3.
18	Stop plate.....	D34B.....	Steel.
19	Bolt (0.625 by 8.625).....	D34C.....	Do.
20	Trail.....	15-3K-27.....	Do.

## CAUTION. (Pl. XI.)

Because of the extreme weight supported by the carriage wheels, it will be necessary to see that the bearings are at all times properly lubricated. Always before moving the carriages any considerable distance, grease should be forced into the hub until it begins to squeeze out along the collars at the ends of the hub.

## 2E.—TRAIL AND WEDGES.

## METHOD OF TRANSPORTATION. (Pl. XII.)

When the gun carriage is moved any distance the firing wedges should be carried on the trail. The method of attaching them is shown on Plate XII. To lift the large wedges into place provision has been made for two handspikes at the large end.

## 2F.—THE LIMBER.

## CONSTRUCTION. (Pl. XIX.)

All limbers for both 5 and 6 inch gun carriages are constructed as shown on Plate XIX. Pull springs have been provided on the draw bars, and spare pull springs will be found in the spring chest of each battery.

## 2G.—BRAKES.

## OPERATION. (Pl. XV and XVI.)

The brake on the front of each carriage is operated by means of a single screw and is so constructed that the shoes bear with equal pressure on the two wheels. The screw and bearings should be kept well oiled with engine oil to insure easy operation. The construction is of sufficient strength to lock the wheels if desired.

## 2H.—TRAVELING LOCK.

## USE. (Pls. XV, XVII, and XVIII.)

The traveling lock provided on the elevating gear side of each carriage is to be used in locking the cradle to the trail whenever the carriage is moved. The importance of the use of this lock can not be too much emphasized since the elevating gear has not been designed to take the stresses that would come upon it in traveling.

## 2I.—SIGHT MECHANISM.

## TO DISASSEMBLE. (Pl. XX.)

## Tools, etc., needed:

Wood mallet.

Stick of pine.

Pin punch.

## PROCEDURE.

1. Disassemble the sight shank socket from the sight socket, as follows:

(a) Remove the pin from the leveling handle at the bottom of the sight shank socket and remove the leveling handle from the leveling screw.

(b) Remove the two pins from the ends of the hinge pin on which the sight shank socket is suspended and remove the hinge pin from the bracket.

## TO ASSEMBLE.

## Tools, etc., needed:

Wood mallet.

Pin punch.

## PROCEDURE.

1. Assemble the sight shank socket to the sight bracket, as follows:

(a) Fit the socket to the bracket, passing the leveling screw through the leveling swivel and insert the hinge pin.

- (b) Insert the pins in the ends of the hinge pin.
- (c) Slip the leveling handle over the end of the leveling screw and pin it in place.

## TO ADJUST.

Tools, etc., needed:

Small screw driver.  
Testing level.

Muzzle and breech bore sights.

## PROCEDURE:

1. Adjust the range strip on the sight shank, as follows:
  - (a) Set the gun in a horizontal position by means of the testing level.
  - (b) Set the angle of site at 0 and maneuver the sight shank and sight-shank socket until both levels register 0.
  - (c) Release the range strip screws and set the strip so that the elevation reads 0.
2. Adjust the panoramic sight, as follows (Pl. XXI):
  - (a) Set the gun in a horizontal position and adjust the range strip as directed above.
  - (b) Lay the gun on some distant point and set the panoramic sight on the same point.
  - (c) In case the arrow A on the indicator plate RL does not point to the index arrow I, release the screw between R and L, and set A opposite I.

NOTE.—It is probable that the adjustment just described need never be made in the field since the panoramic sight, sight shank, and sight bracket have all been carefully adjusted by the manufacturer. Further, the graduated knurled head may be turned any desired amount about the indicator plate RL, and any lack of mechanical adjustment may thereby be taken care of along with reflection adjustments for drift, etc.

## PART III.

## REFERENCES.

## Sec. 1.—FIRE-CONTROL INSTRUMENTS.

For full description of and instructions on the various fire-control instruments see the following pamphlets:

Reel and cart—instructions furnished with vehicle.  
Range finder, Pamphlet No. 1796.  
Battery commander's telescope, Pamphlet No. 1796.  
Aiming circle, Pamphlet No. 1796.  
T. O. B. clock—instructions furnished with instruments.  
T. A. B. clock—instructions furnished with instruments.  
Correction book—instructions furnished with instruments.  
Elevation slide rule—instructions furnished with instruments.

## Sec. 2.—MOTOR VEHICLES.

For full description of and instructions for the care of motor vehicles see the following pamphlets:

Instruction for the care and maintenance of—  
F. W. D. 3-ton truck chassis.  
Nash 2-ton truck chassis.  
Artillery repair truck.  
Artillery supply truck.  
15-ton artillery tractor.  
20-ton artillery tractor.



## PART IV.

### LISTS OF EQUIPMENT.

#### Sec. 1.—LIST OF TOTAL EQUIPMENT FOR 5 AND 6 INCH CONVERTED SEACOAST GUN BATTERIES.

KEY TO SYMBOLS USED IN COLUMNS 8 AND 9.

- |   |   |
|---|---|
| <p>A. 5-inch gun, model of 1897.<br/>         B. 6-inch gun, model of 1900.<br/>         C. 6-inch gun, model of 1903.<br/>         D. 6-inch gun, model of 1905.<br/>         a. 5-inch carriage, model of 1917.<br/>         b. 6-inch carriage, model of 1917, type A.<br/>         d. 6-inch carriage, model of 1917.<br/>         e. Transport vehicle.<br/>         1. Limber.<br/>         2. Spare parts chest (small).<br/>         3. Spare parts chest (small).<br/>         3. Testing level chest.<br/>         4. Carpenter's chest.<br/>         5. Cleaning materials and small-stores chest.<br/>         6. Duplex chain block chest.</p> | <p>7. Trail box.<br/>         8. Spring chest.<br/>         9. Signal, reconnaissance, and fire-control chest.<br/>         10. Spare parts chest (large).<br/>         11.<br/>         12. Stores chest.<br/>         13. Blacksmith's chest.<br/>         14.<br/>         15. Heavy tools chest.<br/>         16.<br/>         17. Supply truck bench chest.<br/>         18. Supply truck floor boxes.<br/>         19. Attached to carriage.<br/>         20. Attached to trucks.<br/>         21. Miscellaneous supply truck (ammunition truck.)</p> |
|---|---|

NOTE TO BATTERY COMMANDERS.—This handbook has necessarily been completed before the equipment of any of the batteries has been assembled. An attempt has been made in column 9 to specify where each article will be carried. Changes will surely be made in the actual distribution of equipment and battery commanders are advised to check column 9 at their earliest opportunity and make the necessary revisions.

#### WHEELED MATÉRIEL.

1	2	3	4	5	6	7	8	9
Article.	Article No.	Number for 1 battery.	Number for battalion headquarters.	Number for regimental headquarters.	Total for 1 regiment.	Spare at depot for 24 guns.	For gun or carriage No.—	Carried in or on—
Ammunition trucks.....	1	14	1	1	88	.....	a, b, c	.....
Artillery repair truck.....	2	0	1	1	4	.....	a, b, c	.....
Artillery supply truck.....	3	1	1	1	10	.....	a, b, c	.....
Gun carriage.....	4	4	0	0	24	.....	a, b, c	.....
Guns.....	5	4	0	0	24	.....	a, b, c	.....
Limbers.....	6	4	0	0	24	.....	a	.....
Do.....	6	8	0	0	48	.....	b, c	.....
Tractors:								
High-speed.....	7	0	1	1	4	.....	a, b, c	.....
120 horsepower.....	8	4	0	0	24	.....	a	.....
Do.....	8	8	0	0	48	.....	b, c	.....
Transport vehicles.....	9	4	0	0	24	.....	b, c	.....
Telephone trucks.....	10	1	0	0	6	.....	a, b, c	.....
Reel and cart, 6-horse type.....	11	.....	1	1	4	.....	a, b, c	.....

## SIGNAL EQUIPMENT.

1	2	3	4	5	6	7	8	9
Article.	Article No.	Number for 1 battery.	Number for battalion headquarters.	Number for regimental headquarters.	Total for 1 regiment.	Spare at depot for 24 guns.	For gun or carriage No.—	Carried in or on—
Barometer, aneroid.		1	1	1	10		a, b, c.	9
Barometer, mercurial.				1	1		a, b, c.	9
Batteries, tungsten, type A.	10	10		10	100		a, b, c.	9
Buzzers, service.		1		5	50		a, b, c.	9
Cases, battery.		1		1	10		a, b, c.	9
Connector, buzzer, type A.	6	6	6	60			a, b, c.	9
Connector studs, 19 pt.	12	12	12	120			a, b, c.	9
Cords, buzzer.	10	10	10	100			a, b, c.	9
Glasses, field, E. E.	20	20	20	200			a, b, c.	9
Kits, inspector's pocket.	5	5	5	50			a, b, c.	9
Kits, flag, combination artillery.	16	16	16	160			a, b, c.	9
Megaphones.	2	2	2	20			a, b, c.	9
Heliographs.	1	4	3	21			a, b, c.	9
Daylight flash-signal outfits.	1	4	3	21			a, b, c.	9
Night flash-signal outfits.	1	4	3	21			a, b, c.	9
Switchboards, outpost.		1	2	5			a, b, c.	9
Wire, field, miles.	6	12	12	84				
Telephones, complete, model 1917.	6	6	6	60			a, b, c.	9
Plugs, buzzer.	2	2	2	20			a, b, c.	9
Reels, hand.	5	5	5	50			a, b, c.	9
Rolls, ground, type D.	6	6	6	60			a, b, c.	9
Tape, insulating, pounds (4-pound rolls).	2	2	2	20			a, b, c.	9
Thermometers, centigrade.	2	2	2	20			a, b, c.	9
Thermometers, Fahrenheit.	1	1	1	10			a, b, c.	9
Watches, wrist.	20	20	20	200			a, b, c.	9
Wire, buzzer, miles.	2	2	2	20			a, b, c.	9
Wireless set, special.			1	1	4		a, b, c.	9

## FIRE-CONTROL EQUIPMENT.

1	2	3	4	5	6	7	8	9
Article.	Article No.	Number for 1 battery.	Number for battalion headquarters.	Number for regimental headquarters.	Total for 1 regiment.	Spare at depot for 24 guns.	For gun or carriage No.—	Carried in or on—
Azimuth instruments (special).	2	2	2	20	2		a, b, c.	9
Azimuth instruments (periscopic).	2	2	2	20	2		a, b, c.	9
B. C. ruler for 5-inch guns.	10	10	10	100	20		a.	9
B. C. ruler for 6-inch guns.	10	10	10	100	20		b, c.	9
B. C. telescope.		1	1	4	1		a, b, c.	9
B. C. telescope case.		1	1	4	1		a, b, c.	9
B. C. telescope tripod.		1	1	4	1		a, b, c.	9
B. C. telescope tripod case.		1	1	4	1		a, b, c.	9
Correction book.	1	1	1	10	10		a, b, c.	9
<i>Contents:</i>								
Height chart.								
Atmosphere, muzzle velocity, and wind charts, range 50 per cent zone chart, wind component indicator, deflection board, and deflection corrector.								
Elevation slide rule (without ribbon).	1	1	1	10	12		a, b, c.	9
Flashlight, with hood.	5	5	5	50	10		a, b, c.	9
Flashlight, without hood.	16	16	16	160	25		a, b, c.	9
Logarithmic ribbon for elevation slide rule, without scale of angles.	1	1	1	10	12		a, b, c.	9
Logarithmic ribbon for elevation slide rule, with scale of angles.	1	1	1	10	12		a, b, c.	9
Logarithm tables.	6	6	6	60	6		a, b, c.	9
Metal arms, graduated in meters.	3	3	3	30	3		a, b, c.	9
Plotting board.	1	1	1	10	1		a, b, c.	9
Prismatic compass.	2	2	2	20	2		a, b, c.	9
Prismatic compass case.	2	2	2	20	2		a, b, c.	9
Prismatic compass tripod.	2	2	2	20	2		a, b, c.	9
Prismatic compass tripod case.	2	2	2	20	2		a, b, c.	9
Protractor.	2	2	2	20	6		a, b, c.	9
Range and deflection board.	1	1	1	10	1		a, b, c.	9
Range tables.	12	12	12	120	24		a, b, c.	9
Scale, metric.	1	1	1	10	1		a, b, c.	9
Slide rule, model 1917.	1	1	1	10	1		a, b, c.	9
Steel tape, 30-meter.	1	1	1	10	1		a, b, c.	9
Straightedge, 24-inch, model 1917.	1	1	1	10	2		a, b, c.	9
T. O. B. clock.	1	1	1	10	12		a, b, c.	9
T. A. B. clock.	1	1	1	10	12		a, b, c.	9

## RECONNAISSANCE EQUIPMENT.

1	2	3	4	5	6	7	8	9
Article.	Article No.	Number for 1 battery.	Number for battalion headquarters.	Number for regimental headquarters.	Total for 1 regiment.	Spare at depot for 24 guns.	For gun or carriage No.—	Carried in or on—
Curves, French.		1	1	1	10	1	a, b, c.	9
Colluloid, sheets.		8	8	24	96			9
Clinometer.			1	1	4	4	a, b, c.	9
Compass watch.		20	20	60	240		a, b, c.	9
Compass, marching.		10	10	30	120		a, b, c.	9
Drawing instruments, field.		1	1	1	10	1	a, b, c.	9
Drawing ink, black, 3-ounce bottles.		6	6	6	60	6	a, b, c.	9
Drawing ink, red, 3-ounce bottles.		1	1	1	10	1	a, b, c.	9
Erasers, pencil.		2		4	16		a, b, c.	9
Ho'ders' timing pad.			1	1	4	4	a, b, c.	9
Pace tallies.			1	1	4	4	a, b, c.	9
Pencil notebooks.			1	1	4	4	a, b, c.	9
Pads, timing.		4	4	12	48		a, b, c.	9
Paper, sketch (gross).		1		1	4		a, b, c.	9
Pencil's:								
Blue.		2		4	16		a, b, c.	9
Drawing.		4	4	12	48		a, b, c.	9
Green.		2		4	16		a, b, c.	9
Red.		2		4	16		a, b, c.	9
Protectors, pencil-point.		2		4	16		a, b, c.	9
Planetables, complete.		1	1	1	10	1	a, b, c.	9
Ranging rods.		4	4	4	40	4	a, b, c.	9
Stadia, computer.		1	1	1	10	1	a, b, c.	9
Stadia rods.		1	1	1	10	1	a, b, c.	9
Tape, adhesive, rolls.		2		4	16		a, b, c.	9
Transit.		1	1	1	10	1	a, b, c.	9

## SPARE PARTS FOR CARRIAGES.

1	2	3	4	5	6	7	8	9
Article.	Article No.	Number for 1 battery.	Number for battalion headquarters.	Number for regimental headquarters.	Total for 1 regiment.	Spare at depot for 24 guns.	For gun or carriage No.—	Carried in or on—
Axle, 6-inch.						3	b, c	
Axle, 5-inch.						3	a	
Bolts:								
0.5 by 1.625 inch.		4		24	20	20	a, b, c.	2
0.625 by 1.625 inch.		4		24	20	20	a, b, c.	2
0.625 by 2.125 inch.		4		24	20	20	a, b, c.	2
0.625 by 1.9 inch.		4		24	20	20	b	2
0.625 by 2.15 inch.		4		24	20	20	b	2
0.625 by 2.25 inch.		4		24	20	20	a, b, c.	2
0.75 by 2.5 inch.		4		24	20	20	c	2
0.75 by 2.75 inch.		4		24	20	20	a	2
0.75 by 2.875 inch.		4		24	20	20	a, b, c.	2
0.75 by 3 inch.		4		24	20	20	a, b, c.	2
0.75 by 3.5 inch.		4		24	20	20	a, b, c.	2
0.875 by 2.875 inch.		4		24	20	20	a, b, c.	2
1 by 5.375 inch.		4		24	20	20	b	2
1 by 6.25 inch.		4		24	20	20	b	2
1 by 4.75 inch.		4		24	20	20	c	2
1 by 5.625 inch.		4		24	20	20	c	2
1 by 2.75 inch.		4		24	20	20	a, b, c.	2
1 by 3 inch.		4		24	20	20	a, b, c.	2
1 by 3.25 inch.		4		24	20	20	a, b, c.	2
1 by 3.5 inch.		4		24	20	20	a, b, c.	2
1 by 4.375 inch.		4		24	20	20	a, b, c.	2
1 by 5.25 inch.		4		24	20	20	a, c	2
1.125 by 4.375 inch.		4		24	20	20	a, b	2
Tap:								
0.5 by 2.06 inch.		4		24	20	20	a	2
0.5 by 2.19 inch.		4		24	20	20	a	2
0.625 by 1.375 inch.		4		24	20	20	a, b, c.	2
0.625 by 1.5 inch.		4		24	20	20	b, c	2
0.625 by 1.75 inch.		4		24	20	20	b	2
0.75 by 1.875 inch.		4		24	20	20	b	2
0.75 by 2 inch.		4		24	20	20	a	2
0.75 by 2.25 inch.		4		24	20	20	a	2
0.875 by 1.75 inch.		4		24	20	20	a, b	2
0.875 by 1.75 inch.		2		12	10	10	c	
1.125 by 2.5 inch.		4		24	20	20	a	2
1.125 by 2.937 inch.		2		12	20	20	a	2
1.125 by 2.875 inch.		4		24	20	20	b	
1.125 by 3.375 inch.		4		24	20	20	b	
1.125 by 3.15 inch.		1		6	4	4	b	2

## SPARE PARTS FOR CARRIAGES—Continued.

1	2	3	4	5	6	7	8	9
Article.	Article No.	Number for 1 battery.	Number for battalion headquarters.	Number for regimental headquarters.	Total for 1 regiment.	Spare at depot for 24 guns.	For gun or carriage No.—	Carried in or on—
Bolts—Continued.								
Tap—Continued.								
1.125 by 5.75 inch.....		1			6	4	b	2
1.125 by 3 inch.....		4			24	20	c	2
1.5 by 3.75 inch.....		4			24	20	a	2
Carriage, 0.5 by 6.75 inch.....		4			24	20	c	
Carriage, 0.5 by 3.25 inch.....		10			60	50	a, b, c	2
Countersunk—								
0.375 by 1.75 inch.....		4			24	20	a, b, c	2
0.625 by 2.625 inch.....		4			24	20	c	2
Bevel-gear bracket.....						4	b	
Brake shoe.....		20			120	100	a, b, c	10
Brake lever.....						3	a, b, c	
Brake screw.....						3	a, b, c	
Brake-lever pins.....						6	a, b, c	
Brake handwheel.....						5	a, b, c	
Brake-screw nuts.....						2	a, b, c	
Brake transom.....						2	a, b, c	
Co. ar. inner.....		2			12	12	a, b, c	10
Co. lar. outer.....		2			12	12	a, b, c	10
Collar bolt, outer.....		2			12	12	a, b, c	2
Collar-securing screw.....		2			12	8	a, b, c	2
Counter recoil springs:								
Lower, inner.....		4			24	72	b	8
Lower, outer.....		4			24	72	b	8
Upper.....		4			24	72	b	8
Outer.....		6			36	108	c	8
Inner.....		6			36	108	c	8
Lower, inner.....		6			36	108	a	8
Lower, outer.....		6			36	108	a	8
Upper.....		4			24	72	a	8
Cover for sight.....		2			12	10	a, b, c	
Cylinder support, rear, with strap.....		0				3	a	
Drag washer.....		2			12	15	a, b, c	10
Drain plug.....		2			12	10	a	2
Do.....		2			12	10	b	2
Do.....		2			12	3	b	
Elevating gear bracket.....						3	a	
Do.....						2	a	
Do.....		1			6	4	a, b, c	10
Elevating handwheel.....						2	b, c	
Elevating pinion.....						5	a	
Do.....						2	b	
Elevating rack.....		0				5	a	
Do.....		0				2	c	
Do.....		0				2	a, b, c	
Elevating worm.....		0				2	a, b, c	
Elevating worm wheel.....		0				2	a, b, c	
Elevating worm-wheel cover.....		0				2	a, b, c	
Elevating worm wheel and pinion bracket.....		0				2	a, b, c	
Elevating worm shaft.....		0				2	a, b, c	
Elevating worm-shaft collar.....		0				6	a	
Elevating rack bolt.....		0				6	c	
Do.....		1			6	5	a, b, c	3
Engine coupling pin.....		1			6	5	a, b, c	2
Engine coupling-pin key.....		2			12	10	b	
Filler piece.....		2			12	10	a	2
Filling plug.....		2			12	10	c	2
Do.....		2			12	10	b	2
Do.....		0				4	b	
Follower for recoil piston rod.....		0				4	c	
Do for spring rod.....		0				4	b	
Friction disks, sets.....		0				3	a, b, c	
Gaskets (rear cylinder head).....		0				4	c	2
Gaskets (filling drain plugs).....		4			24	24	c	
Gasket, recoil cylinder head front.....		0				4	c	
Do.....		4			24	24	b	
Gasket.....		5			30	20	a	
Do.....		7			42	20	a	
Gland.....		0				15	c	

## SPARE PARTS FOR CARRIAGES—Continued.

1	2	3	4	5	6	7	8	9
Article.	Article No.	Number for 1 battery.	Number for battalion headquarters.	Number for regimental headquarters.	Total for 1 regiment.	Spare at depot for 24 guns.	For gun or carriage No.—	Carried in or on—
Handy oiler, 0.25-inch.....		5			30	25	a, b, c	2
Handy oiler, 0.375-inch.....		5			30	25	a, b, c	2
Hand wheel handles, complete.....		1			6	10	a, b, c	2
Keys, 0.6 by 0.375 by 2 inch.....		1			6	10	a, b, c	2
Keys, 0.191 by 0.44 by 4.5 inch.....		0			6	10	a, b, c	2
Lumber connection.....		4			24	24	a, b, c	2
Linchpins.....		8			48	48	a, b, c	2
Linchpin tie.....		0				5	a	
Link, rear draft.....		2			12	10	a, b, c	10
Lunette.....		4			24	20	b	
Mud guard.....		4			24	24	b	2
Nut, washer, 0.5 inch.....		12			72	24	a, b, c	2
Nuts:								
0.375-inch.....		12			72	24	a	2
0.5-inch.....		12			72	24	a, b, c	2
0.625-inch.....		12			72	24	a, b, c	2
0.75-inch.....		12			72	24	a, b, c	2
0.875-inch.....		12			72	24	a, b, c	2
1-inch.....		6			36	24	b	2
1.25 by 1 inch thick.....		12			72	24	a	2
1.125-inch.....		12			72	24	a	2
1.25-inch.....		6			36	24	c	
1.25-inch (rear draft gear).....		2			12	6	b	
1.5-inch.....		12			72	24	a	2
2 by 1 inch.....		12			72	24	a	2
3.25 by 1.75 inch.....		6			36	24	c	2
1.25-inch.....		4			24	20	a	2
Crown 0.75-inch.....		4			24	20	a	2
Crown 1.25-inch.....		4			24	20	c	2
Crown 0.625-inch.....		4			24	20	b	2
Oil plug, 0.375-inch.....		6			36	24	a	2
Oil plug, 0.625-inch.....		4			24	20	a	2
Packing, Garlock, 0.75-inch square rings.....		10			60	40	b, c	2
Packing, Garlock, 0.875-inch square rings.....		10			60	40	a	2
Packing.....		8			48	24	a	2
Panoramic-sight case (complete).....		1			6	2	a, b, c	
Pins:								
Bronze, 0.375 by 2.125 inch.....		2			12	10	a	2
Bronze, 0.125 by 0.625 inch.....		2			12	10	a	2
Split, 0.125 by 0.75 inch.....		10			60	50	a, b, c	2
Split, 0.125 by 1 inch.....		10			60	50	a, b, c	2
Split, 0.187 by 0.75 inch.....		6			36	24	a, b, c	2
Split, 0.25 by 1.25 inch.....		6			36	24	a, b, c	2
Split, 0.375 by 4 inch.....		6			36	24	a, b, c	2
Split, 0.5 by 4.75 inch.....		6			36	24	a, b, c	2
Split, 0.203 by 1.5 inch.....		4			24	20	a, b, c	2
Split, 0.203 by 1.25 inch.....		4			24	25	c	
Split, 0.093 by 0.5 inch.....		10			60	50	a, b, c	
Split, 0.0781 by 0.437 inch.....		10			60	50	a, b, c	
Split, 0.156 by 0.5 inch.....		6			36	24	a, b, c	
Taper, 0.208 by 2.75 inch.....		4			24	24	a, b	
Taper, 0.208 by 2.375 inch.....		4			24	24	a, b	
Taper, 0.279 by 3.25 inch.....		4			24	24	a	
Taper, 0.279 by 3.5 inch.....		4			24	24	b, c	2
Taper, 0.162 by 1.625 inch.....		4			24	24	c	
Taper, 0.398 by 5.75 inch.....		4			24	24	c	2
Taper, 0.279 by 4.625 inch.....		2			12	12	b, c	10
Plunger spring.....		2			12	24	a	2
Pinion bracket stud.....		4			24	24	c	2
Do.....		4			24	24	b	2
Do.....		4			24	24	c	10
Piston-rod cap.....		4			24	24	c	10
Piston-rod nut.....		1			6	5	b, c	
Rear draft link.....		4			24	24	b, c	2
Retaining screw.....		2			12	8	a, b, c	10
Rope, hemp, 1 inch by 19 feet.....		2			12	8	a, b, c	10
Rope, hemp, 1.25-inch by 19 feet.....		2			12	8	a, b, c	10
Screw eye.....		4			24	15	b	10
Screws:								
Fillister head, 0.312 by 0.375 inch.....		6			36	30	a, b, c	2
Fillister head, 0.625 by 1 inch.....		6			36	20	b, c	2
Lag, 0.625 by 6 inch.....		10			60	50	a, b, c	2

## SPARE PARTS FOR CARRIAGES—Continued.

1	2	3	4	5	6	7	8	9
Article.	Article No.	Number for 1 battery.	Number for battalion headquarters.	Number for regimental headquarters.	Total for 1 regiment.	Spare at depot for 24 guns.	For gun or carriage No.—	Carried in or on—
Screws—Continued.								
Round head, bronze, 0.375 by 0.5 inch.		6			36	20	a, b	2
Round head, steel.		10			60	50	a	2
Wood, No. 14 by 1 inch.		24			144	100	b, c	2
Fillister head, 0.625 by 1 inch.		6			36	30	a	
Fillister head, 0.75 by 2.5 inch.		5			30	20	c	
Wood, No. 14 by 1 inch.		10			60	50	a	
Round head, bronze, 0.375 by 0.5 inch.		10			60	50	c	
Countersunk head, steel, 0.216 by 0.625 inch.		10			60	40	b	
Countersunk head, 0.312 by 0.625 inch.		6			36	30	c	
Securing chains, 4 links.		1			6	10	a, b, c	2
Securing chains, 7 links.		1			6	10	a, b, c	2
Shackle.		2			12	12	a, b, c	10
Shackle pin (15-15U-4).		2			12	12	a, b, c	2
Sight, model 1918 (with bracket, 15-15U-4).		1			6	6	a, b	
Sight, model 1918, bracket, 15-15U-6.		1			6	6	c	
Sights:								
Panoramic, model 1917, 5-inch, 17.		1			6	6	a	
Panoramic, model 1917, 6-inch, A.		1			6	6	b	
Panoramic, model 1917, 6-inch, 17.		1			6	6	c	
Sockets, handspike.		0				4	a, b, c	
Spring compressor nut.		2			12	10	b	10
Spring cylinder.		0				2	h	
Do.		0				2	a	
Do.		0				2	c	
Spring cylinder head.		0				4	b	
Spring rod nut.		4			24	20	c	10
Spring rod nut, upper.		4			24	20	a	10
Spring rod nut, lower.		4			24	20	a	10
Spring cylinder bracket.		0				3	b	
Spring cylinder support, rear.		0				3	b	
Spring cylinder bearing support.		0				3	b	
Spring rod piston.		0				10	b	
Do.		0				10	a	
Do.		0				10	c	
Spring rod yoke.		2			12	12	b	10
Do.		0				6	a	
Spring rod.		0				4	a	
Spring rod, upper.		0				4	a	
Spring rod, lower.		0				4	a	
Spring rod.		0				20	b	
Spring separator, complete.		0				20	a	
Spring separator, lower.		0				20	a	
Spring separator, upper.		0				4	c	
Spring rod.		4				20	a	10
Spring separator bushing, upper.		0				20	c	
Spring separator, separator bushing.		0				2	c	
Spring head.		2			12	10	c	2
Spring, 0.039 inch, steel wire.		2			12	20	b	2
Stay bolts.		2			12	20	a	2
Do.		2			12	20	a	2
Do.		2			12	20	b, c	2
Stay, rear draft link, right.		1			6	5	b, c	10
Do.		1			6	5	a	10
Stay, rear draft link, left.		1			6	5	b, c	10
Do.		1			6	5	a	10
Stop plate.		0				24	b, c	
Strap, 36 inches long.		10			60	50	a, b, c	
Stuffing box.		0				1	a	
Stuffing box, nut.		0				4	a	
Support strap.		0				2	b	
Support, bolt, rear.		2			12	10	b	10
Tools for carriages, sets, complete.		0				2	b	
Do.		0				2	a	
Do.		0				2	c	
Trunnion bearing.		0				4	c	
Trunnion bearings.		0				4	b	
Do.		0				4	a	

\* Will be furnished by Ordnance Department.

## SPARE PARTS FOR CARRIAGES—Continued.

1	2	3	4	5	6	7	8	9
Article.	Article No.	Number for 1 battery.	Number for battalion headquarters.	Number for regimental headquarters.	Total for 1 regiment.	Spare at depot for 24 guns.	For gun or carriage No.—	Carried in or on—
Trunnion bearings, cover.		0				4	c	
Trunnion bearings, screw.		4			24	32	c	2
Washer.		1			6	6	a, b, c	2
Lock, 0.375 inch.		12			72	24	a, b, c	2
Lock, 0.5 inch.		12			72	24	a	2
Lock, 0.625 inch.		12			72	24	a, b, c	2
Lock, 0.75 inch.		12			72	24	a, b, c	2
Lock, 0.875 inch.		12			72	24	a, b, c	2
Lock, 1 inch.		12			72	24	a, b, c	2
Lock, 1.125 inches.		12			72	24	a, b, c	2
Lock, 1.25 inches.		12			72	24	b	
Lock, 1.5 inches.		12			72	24	a	2
Wedge, large, right.		1			6	3	a, b, c	21
Wedge, small, right.		1			6	3	a, b, c	21
Wedge, large, left.		1			6	3	a, b, c	21
Wedge, small, left.		1			6	3	a, b, c	21
Wheel, complete.		0				4	a, b, c	

## MISCELLANEOUS SPARE PARTS.

1	2	3	4	5	6	7	8	9
Article.	Article No.	Number for 1 battery.	Number for battalion headquarters.	Number for regimental headquarters.	Total for 1 regiment.	Spare at depot for 24 guns.	For gun or carriage No.—	Carried in or on—
Handles:								
Axe.		4					a, b, c	16
Hatchet.		4					a, b, c	16
Hammer.		2					a, b, c	16
Sledge.		1					a, b, c	16
Long shovel.		2					a, b, c	16
Short shovel.		2					a, b, c	16
Pick.		2					a, b, c	16

## STORES.

1	2	3	4	5	6	7	8	9
Article.	Article No.	Number for 1 battery.	Number for battalion headquarters.	Number for regimental headquarters.	Total for 1 regiment.	Spare at depot for 24 guns.	For gun or carriage No.—	Carried in or on—
Borax, pounds.		10			60	100	a, b, c	12
Brushes:								
Sash, No. 3-0.		3	3	3	30	24	a, b, c	5
Sash, No. 5-0.		3	3	3	30	24	a, b, c	5
Varnish, No. 5-0.		2	2	2	20	24	a, b, c	5
Varnish, No. 4-0.		2	2	2	20	24	a, b, c	5
Varnish, No. 6-0.		2	2	2	20	24	a, b, c	5
Camel's hair, No. 1.		2	2	2	20	24	a, b, c	5
Carbide, pounds (0.25 screen).		10	10	10	100	200	a, b, c	12
Charcoal skins.		4	1	1	28	24	a, b, c	5, 12
Cord, sash, 0.25 by 100 foot rolls.		6			36	24	a, b, c	12
Crocus cloth, quarters.		5	1	1	34	20	a, b, c	5, 12
Cleaning material and small stores chest.		1	1	1	10	3	a, b, c	
Emery cloth:								
No. 00, quarters.		5	1	1	34	20	a, b, c	5, 12
No. 0, quarters.		5	1	1	34	20	a, b, c	5, 12
No. 1, quarters.		5	1	1	34	20	a, b, c	5, 12
Graphite grease, 5-pound can.		2	1	1	16	16	a, b, c	12
Lye, powdered, pounds.		25			150	100	a, b, c	12
Oil:								
Light slushing, cans.		2			12	24	a, b, c	12
Sperm, 1-gallon can.		1			6	6	a, b, c	12
Clock (one oz. bottles).		1	1	1	10	10	a, b, c	5
Hydrolite, 5-gallon cans.		3			18	20	a, b, c	12
Lubricating engine No. 1, 5-gallon cans.		2			12	12	a, b, c	12
Boiled linseed, 5-gallon cans.		1			6	6	a, b, c	12
Raw linseed, pints.		1	1	1	10	252	a, b, c	12
Kerosene, gallons.		5	5	5	50	100	a, b, c	12
Turpentine, gallon cans.		5			30	60	a, b, c	12
Paint:								
00, second coat, gallons.		5			30	30	a, b, c	12
Japan drier, quart cans.		5			30	30	a, b, c	12
Primer brown enamel, quarts.		3			18	18	a, b, c	12
Rubberine, 5-gallon cans.		1			6	6	a, b, c	12
Rottenstone, pounds.		3			18	24	a, b, c	12

## STORES—Continued.

1	2	3	4	5	6	7	8	9
Article.	Article No.	Number for 1 battery.	Number for battalion headquarters.	Number for regimental headquarters.	Total for 1 regiment.	Spare at depot for 24 guns.	For gun or carriage No.—	Carried in or on—
Sal soda, pounds.....		75			450	500	a, b, c	12
Sandpaper:								
No. 00, quires.....		5	1	1	34	24	a, b, c	5, 12
No. 1, quires.....		5	1	1	34	24	a, b, c	5, 12
No. 15, quires.....		5	1	1	34	24	a, b, c	5, 12
No. 2, quires.....		5	1	1	34	24	a, b, c	5, 12
Sealing wax, sticks.....		2	1	1	16	24	a, b, c	12
Soap, Gibson's Polish, 16-ounce cans.....		6	2	2	44	24	a, b, c	12
Soap:								
Castile, pound, cakes.....		6	2	2	44	144	a, b, c	12
H. & H., 0.75-pound cakes.....		6	2	2	44	144	a, b, c	12
Lavaline, pint cans.....		6	2	2	44	50	a, b, c	12
Sponges, 6.....		2	2	2	20	24	a, b, c	5
Vaseline, 5.5-ounce cans.....		1	1	1	10	12	a, b, c	5
Waste, cotton, pounds.....		50	50	50	500	300	a, b, c	18
Webbing, O. D., 0.625 wide, yards.....		21			126	100	a, b, c	12
Webbing, O. D., 1 wide, yards.....		32			192	100	a, b, c	12
Wicks, lantern.....		24	12	12	192	100	a, b, c	5

## SPARE PARTS FOR GUNS.

NOTE.—Spare parts have been provided on the basis of the following grouping of guns:  
 5-inch, Model of 1897, 7 batteries.  
 6-inch, Model of 1900, 5 batteries.  
 6-inch, Model of 1903, 15 batteries.  
 6-inch, Model of 1905, 3 batteries.

1	2	3	4	5	6	7	8	9
Article.	Article No.	Number for 1 battery.	Number for battalion headquarters.	Number for regimental headquarters.	Total for 1 regiment.	Spare at depot for 24 guns.	For gun or carriage No.—	Carried in or on—
Breechblock oil-hole screw.....		3			18	4	A	2
Do.....		3			18	30	B	2
Do.....		3			18	30	C	2
Breechblock stop screws.....						7	A	2
Breechblock pallet.....						10	B	2
Do.....						14	A	2
Breechblock screw.....						3	A, C, D	2
Breech mechanism complete.....		1			6	5	B	2
Do.....		1			6	2	A, C, D	2
Block carrier.....						5	B	2
Do.....						10	B	2
Breechblock stop.....						5	B	2
Breech bushing.....						24	C	2
Carrier bushing.....		2			18	36	D	2
Carrier latch detent.....		2			12	24	D	2
Carrier latch spring.....		1			6	12	D	2
Carrier latch.....		1			6	12	D	2
Carrier latch catch.....		2			12	24	D	2
Carrier latch catch screw.....		2			12	24	C, D	2
Ejector.....		2			12	14	A	2
Do.....		2			12	20	B	2
Ejector pivot.....		2			12	12	C	2
Ejector pivot pin.....		2			12	12	C	2
Ejector springs.....		2			12	24	C	2
Filling-in disk.....		7				5	A	2
Do.....						6	B	2
Do.....							C, D	2
Firing leaf.....		2			12	24	C, D	2
Do.....		2			12	14	A	2
Do.....		2			12	20	B	2
Firing-leaf pivot.....		2			12	14	A	2
Do.....		2			12	12	C	2
Firing-leaf pivot pin.....		2			12	14	A	2
Do.....		2			12	12	C, D	2
Firing mechanism, complete.....		1			6	3	A, C, D	2
Do.....		1			6	5	B	2
Firing-lever pivot.....		2			12	12	C, D	2
Firing-lever pivot pin.....		2			12	12	C, D	2
Firing-leaf spring.....		3			18	42	A	2
Do.....		3			18	30	B	2
Firing-leaf spring screw.....		2			12	14	A	2
Firing lever.....		2			12	24	C, D	2
Firing-lever spring.....		2			12	24	C, D	2

## SPARE PARTS FOR GUNS—Continued.

1	2	3	4	5	6	7	8	9
Article.	Article No.	Number for 1 battery.	Number for battalion headquarters.	Number for regimental headquarters.	Total for 1 regiment.	Spare at depot for 24 guns.	For gun or carriage No.—	Carried in or on—
Firing-lever spring screw.....		2			12	24	D	2
Front split ring.....		2			12	14	A	2
Do.....		2			12	20	B	2
Do.....		2			12	24	D	2
Gas-check pad.....		3			18	14	A	2
Do.....		3			18	30	A	2
Do.....		3			48	48	C, D	2
Gear segment.....						7	A	2
Do.....						5	B	2
Gear segment screw A.....						1	A	2
Do.....		2			12	20	B	2
Gear segment screw B.....						7	A	2
Do.....		2			12	20	B	2
Gear segment screw C.....						7	A	2
Handy oiler (hinge pin).....		3			18	12	D	2
Handy oiler (inner pivot).....		3			18	36	D	2
Handy oiler (operating lever pivot "A" and "B").....		2			12	12	D	2
Handy oiler, 1/4-inch.....		2			12	12	D	2
Hinge.....						7	A	2
Hinge pin.....		1			6	14	A	2
Do.....		1			6	10	B	2
Do.....		1			6	12	C, D	2
Hinge-pin catch.....		1			12	14	A	2
Do.....		3			18	30	B	2
Hinge-pin nut and pin.....		1			6	12	D	2
Hinge-pin oil-hole screw.....		2			12	14	A	2
Do.....		3			18	30	B	2
Hinge-pin catch screw.....		3			18	30	C, D	2
Hinge-pin nut.....		1			6	12	C, D	2
Hinge-lug pallet screw.....						4	C	2
Hinge-lug bushing.....		2			12	12	C	2
Hinge plate.....						2	C	2
Hinge-plate screw.....						12	C	2
Hinge-plate screw (A).....						2	C	2
Hinge-plate screw (B).....						6	C	2
Hinge ring.....						6	D	2
Hinge-ring screw (short).....						30	D	2
Hinge-ring screw (long).....						7	A	2
Housing-spline screw.....		1			6	7	A	2
Housing mechanism.....		1			6	12	A	2
Housing (for slide).....		2			12	12	C	2
Housing (firing mechanism).....		2			12	28	A	2
Interior split ring.....						12	A	2
Do.....		3			18	20	B	2
Latch.....		1			6	14	A	2
Latch bolt.....		1			6	10	B	2
Do.....		1			6	14	A	2
Latch lever.....		1			6	10	B	2
Do.....		1			6	14	A	2
Latch-lever pivot.....		1			6	10	B	2
Do.....		1			6	10	A	2
Latch-lever spring.....		3			18	42	A	2
Latch-bolt seat.....		1			6	10	B	2
Latch-bolt seat and tripping-stud screw.....						24	B	2
Latch pallet.....		4				2	C	2
Latch-pallet screw.....						2	C	2
Latch retainer.....						2	C	2
Latch-retainer spring.....		3			18	24	C	2
Latch-retainer spring screw.....						6	C	2
Lever.....						7	A	2
Lever-latch bolt.....						6	C, D	2
Lever-latch bolt spring.....		2			12	24	C, D	2
Lever-latch housing.....						12	C, D	2
Lever-latch housing screw.....						24	C, D	2
Lever-latch bolt seat.....						6	D	2
Lock-bolt seat.....						14	A	2
Loading-tray latch-bolt spring.....		2			12	24	A	2
Loading-tray parts (assembled).....						7	A	2
Do.....						5	B	2
Do.....						10	D	2



## SPARE PARTS FOR GUNS—Continued.

1	2	3	4	5	6	7	8	9
Article.	Article No.	Number for 1 battery.	Number for battalion head-quarters.	Number for regimental head-quarters.	Total for 1 regiment.	Spare at depot for 24 guns.	For gun or carriage No.—	Carried in or on—
Loading tray (automatic).....						5	B	2
Cam plate.....						5	B	2
Cam-plate screws.....						15	B	2
Guide screw.....						5	B	2
Steel point.....						5	B	2
Loading-tray pivot.....		1			6	5	B	2
Loading tray (cast steel).....						12	C, D	2
Loading-tray latch bolt.....						10	C	2
Loading-tray latch-bolt nut.....						10	C	2
Loading tray (built up).....						10	C	2
Lanyard loop.....						12	C, D	2
Obturator spindle.....						7	A	2
Do.....						5	B	2
Do.....						6	C, D	2
Obturator-spindle key.....						7	A	2
Do.....						7	A	2
Obturator-spindle key screw.....						5	B	2
Obturator-spindle plug.....						10	B	2
Obturator-spindle plate.....						24	C, D	2
Obturator-spindle spring.....		2			12	6	C, D	2
Operating lever.....						6	C, D	2
Operating-lever handle.....						6	C	2
Operating spool.....						6	D	2
Operating-lever pivot A.....						6	D	2
Operating-lever pivot B.....						6	D	2
Operating-lever handle sleeve.....						6	D	2
Operating-lever handle washer.....						12	D	2
Operating-lever pivot key.....						6	D	2
Operating link.....						6	D	2
Operating-link pivot.....						7	A	2
Pinion.....						10	B	2
Do.....						7	A	2
Pinion pivot.....						10	B	2
Do.....						7	A	2
Pinion-pivot nut.....						10	B	2
Do.....						7	A	2
Pinion-pivot pin.....						10	B	2
Do.....						6	C, D	2
Rack.....								
Radial head screw (segment), 0.5 inch.....						36	D	2
Radial head screw (segment), 0.25 inch.....						36	D	2
Rack lock.....						6	C	2
Rack-lock handle.....						6	C	2
Rack-lock spring.....		2			12	24	C	2
Rear split ring.....		2			12	24	D	2
Do.....		2			12	28	A	2
Do.....		2			12	20	B	2
Roller.....		2			12	20	C	2
Roller axle.....		2			12	24	A	2
Safety bar.....		1			6	14	A	2
Safety-bar pivot.....		1			6	14	A	2
Safety-bar operating stud.....		1			6	14	A	2
Safety lever.....		2			12	20	B	2
Safety plunger.....		2			12	24	D	2
Safety-plunger spring.....		2			12	24	D	2
Securing screws.....		6			36	72	C	2
Securing-screw washers.....		6			36	72	C	2
Securing screw.....		6			36	60	B	2
Securing-screw washer.....		6			36	60	B	2
Slide.....		2			12	14	A	2
Do.....		2			12	20	B, C, D	2
Slide catch.....		2			12	14	B	2
Do.....		2			12	20	B	2
Do.....		1			6	24	D	2
Side-catch spring.....		2			12	24	D	2
Do.....		2			12	14	A	2
Do.....		2			12	20	B	2
Slide-catch pivot.....		1			6	10	D	2
Do.....						6	D	2
Slide-catch pivot pin.....						6	D	2
Slide housing.....		1			6	10	B	2

## SPARE PARTS FOR GUNS—Continued.

1	2	3	4	5	6	7	8	9
Article.	Article No.	Number for 1 battery.	Number for battalion head-quarters.	Number for regimental head-quarters.	Total for 1 regiment.	Spare at depot for 24 guns.	For gun or carriage No.—	Carried in or on—
Slide stop.....		2			12	24	B	2
Do.....		2			12	14	A	2
Do.....		2			12	20	B	2
Slide-stop spring.....		2			12	14	A	2
Do.....		2			12	20	B	2
Slide-stop nut and pin.....		2			12	14	A	2
Do.....		2			12	20	B	2
Slide-stop housing.....		2			12	14	A	2
Spindle-ball washer.....		2			12	28	A	2
Spindle-ball washer connector.....		2			12	14	A	2
Spindle-ball washer.....		2			12	20	B	2
Spindle key.....		2			12	24	C	2
Do.....		2			12	12	D	2
Spindle nut.....		2			12	14	A	2
Spindle-nut clamping screw.....		2			12	20	B	2
Do.....		2			12	14	A	2
Spindle nut.....		2			12	20	B	2
Split ring (front).....		2			12	24	C	2
Split ring (rear).....		2			12	24	C	2
Split ring (small).....		2			12	24	C, D	2
Steel plug.....						6	C	2
Tray latch.....						6	D	2
Tray latch stop screw.....						3	D	2
Tripping stud.....						14	A	2
Do.....						10	D	2
Tray latch spring.....		2			12	12	D	2
Yoke pin.....		2			12	20	B	2

## TOOLS AND ACCESSORIES.

1	2	3	4	5	6	7	8	9
Article.	Article No.	Number for 1 battery.	Number for battalion head-quarters.	Number for regimental head-quarters.	Total for 1 regiment.	Spare at depot for 24 guns.	For gun or carriage No.—	Carried in or on—
Anvil.....		1			6	1	a, b, c	13
Assembling frame for 6-inch guns.....		2			12	2	a, b, c	18
Auger bits, $\frac{1}{2}$ , $\frac{3}{4}$ , 1, 1 $\frac{1}{4}$ , 1 $\frac{1}{2}$ inch (set).....		6	6	6	60	6	a, b, c	4
Auger handle plate.....		1	1	1	10	6	a, b, c	4
Axes, bench.....		1	1	1	10	6	a, b, c	4
Axes, hand.....		15	4	6	108	100	a, b, c	4
Bag, canvas, for small stores.....		3	3	3	30	3	a, b, c	4
Bag, coal, large.....		1			6	3	a, b, c	13
Barrow, shot.....		4			24	2	a, b, c	18
Bevel, 8-inch.....		1	1	1	10	6	a, b, c	4
Bits, screw-driver, $\frac{1}{8}$ , $\frac{3}{16}$ , $\frac{1}{4}$ inch.....		3	3	3	30	6	a, b, c	4
Bit and countersink, $\frac{1}{8}$ -inch.....		1	1	1	10	6	a, b, c	4
Bit, expansion.....		1	1	1	10	6	a, b, c	4
Blocks, double tackle.....		2	1	1	16	12	a, b, c	15
Blocks, duplex, chain, 4-ton.....		1			24	2	b, c	6
Blocks, single, for 1-inch rope, sheave 6 inches diameter:								
Without bucket.....		4			24	12	b, c	18
With bucket.....		4			24	12	b, c	18
Bolos, with scabbards.....		20	20	20	200	200	a, b, c	15
Bore sponge.....		4			48	48	a, b, c, d	15
Bore-sponge cover.....		4			6	6	a, b, c, d	7
Box, oil can, $\frac{1}{2}$ -pint.....		4			24	3	a, b, c	4
Brace, ratchet, 10-inch sweep.....		1	1	1	10	3	a, b, c	4
Brushes:								
Cleaning, for primer seat.....		12	16		120	48	a, b, c, d	7
Scratch.....		1	1	1	10	6	a, b, c	11
Slush (socket to fit sponge staff).....		4	8		48	24	a, b, c	18
Bucket, galvanized-iron.....		2	2	2	20	12	a, b, c	20
Burners, lantern.....		2	2	2	24	12	a, b, c	12
Cans, 5-gallon.....		4			12	12	a, b, c	12
Cans, 7 $\frac{1}{2}$ -gallon.....		2			12	12	a, b, c	12
Card, file.....		4	2		30	12	a, b, c	7
Chests:								
Spare parts, 20 by 40 by 24 inches.....		1			6		a, b, c	11
Spare parts, 20 by 40 by 12 inches.....		2	1	1	16		a, b, c	18
Carpenter's.....		1	1	1	10	3	a, b, c	7
Blacksmith's.....		1			6	1	a, b, c	15

## TOOLS AND ACCESSORIES—Continued.

1	2	3	4	5	6	7	8	9
Article.	Article No.	Number for 1 battery.	Number for battalion headquarters.	Number for regimental headquarters.	Total for 1 regiment.	Spare at depot for 24 guns.	For gun or carriage No.—	Carried in or on—
<b>Chests—Continued.</b>								
Triplex block, 20 by 40 by 12 inches.		1			6		a, b, c	
Heavy tools.		1			6		a, b, c	
Spring, 20 by 40 by 24 inches.		1			6		a, b, c	
Fire-control.		1	1	1	10		a, b, c	
Stores, 20 by 40 by 24 inches.		1			6		a, b, c	
Stores, 20 by 40 by 12 inches.		1	1	1	4		a, b, c	
Cleaning materials.		1	1	1	10		a, b, c	
Testing level.		1	1	1	10		a, b, c	
Chisel, cold, 8-inch.		1			6	6	a, b, c	13
Chisel, handled, for cold iron.		1			6	3	a, b, c	13
Chisel, handled, for hot iron.		1			6	3	a, b, c	13
Chisels, socket, framing, $\frac{1}{2}$ , 1, $1\frac{1}{2}$ inch (set).		3	3	3	30	6	a, b, c	4
Cloth, emery, quire, No. 00.		4	12		60	108	A, B, C, D	
Combination tool, 10 tools.		1	1	1	10		a, b, c	4
Copper wire, No. 12, 2 pounds.		4	6		36	18	A, B, C	18
Copper wire, No. 16, 2 pounds.		4	6		36	18	A, B, C	18
<b>Covers:</b>								
Breech.		4			24	24	A, B, C, D	7
Muzzle.		4			24	24	A, B, C, D	7
Sight.		4			24	6	a, b, c	7
Sponge.		4			24	6	a, b, c	13
Crowbars, U58C.		4	1	1	24	2	a, b, c	18
Dividers, wing, 10-inch.		1	1	1	10	6	a, b, c	4
Drawing knife.		1	1	1	10	6	a, b, c	4
Drift, bronze, small.		4	4		36	12	a, b, c	7
Drift, bronze, large.		4	4		36	12	a, b, c	7
<b>Drills:</b>								
Gunner's.		4	4		36	12	a, b, c	7
Flat.		1			6	6	a, b, c	13
Twist, 6/32, 7/32, 8/32, 9/32 (set).		1	1	1	10	6	a, b, c	4
Drill, twist (set), square shank, 0.5, 0.625, 0.875, and 1.		1			6	6	A, B, C	13
<b>Files:</b>								
Flat, dead smooth, 8 inches.		4	4		36	12	a, b, c	18
Flat, smooth, 8 inches.		4			24		a, b, c	7
Flat, bastard, 10 inches.		1	1	1	10	6	a, b, c	4
Flat, bastard, 12 inches.		1			6	3	a, b, c	13
Half-round, smooth, 8 inches.		12	16		120	64	a, b, c	7
Round, smooth, 8 inches.		12	16		120	64	a, b, c	7
Round, second cut, 8 inches.		4	4		36	12	a, b, c	18
3-cornered, No. 4, 6 inches.		12	16		120	64	a, b, c	7
Saw, 4.		3	3	1	28	18	a, b, c	4
Saw, 6.		1	1	1	10	12	a, b, c	18
3-cornered, 8 inches.		4	4		36	12	a, b, c	7
Pillar, No. 6, 6 inches.		12	16		120	64	a, b, c	7
Firing mechanism, box.		4	2		30	6	a, b, c	13
Flatter, handled.		1			6	3	a, b, c	13
Fore punch and creaser.		1			6	3	a, b, c	13
Forge, Empire, portable.		1			6	2	a, b, c	13
Funnel, U46H.		1			24	2	C	18
Funnel, filling, U46V.		4			24	2	B	18
Funnel, filling, U46D.		4			24	2	B	18
Fuse setter, in case.		1			48		a, b, c	18
Gauge, marking.		1	1	1	10	6	a, b, c	4
Gauge, socket, firmer, $\frac{1}{2}$ and 1 inch.		2	1	1	20	12	a, b, c	4
Globes, lantern.		2	1	1	16	60	a, b, c	20
Grindstone.		1	1	1	6	3	a, b, c	15
<b>Hammer:</b>								
Hand, 2-pound.		1			6	3	a, b, c	13
Machinist's ball peen, 2-pound.		4	2		30	12	a, b, c	7
Claw.		1	1	1	10	12	a, b, c	4
Riveting, 18-ounce.		1			6	3	a, b, c	7
Copper.		4	2		30	12	a, b, c	18
Handle, file, aluminum.		2	2	2	20	12	a, b, c	4, 5
<b>Handles:</b>								
Ax.		3	1	1	22	12	a, b, c	20
Hatchet.		6	1	2	41	24	a, b, c	20
Pick.		6	2	2	44	24	a, b, c	20
Shovel, long.		3	1	1	22	12	a, b, c	20
Shovel, short.		3	1	1	22	12	a, b, c	20
Handspikes.		10			60	48	a, b, c	19

## TOOLS AND ACCESSORIES—Continued.

1	2	3	4	5	6	7	8	9
Article.	Article No.	Number for 1 battery.	Number for battalion headquarters.	Number for regimental headquarters.	Total for 1 regiment.	Spare at depot for 24 guns.	For gun or carriage No. —	Carried in or on—
Hardie, $\frac{1}{2}$ -inch, square shank, $1\frac{1}{2}$ -inch bit.		1			6	3	a, b, c	13
Hatchets.		30	7	11	212	100	a, b, c	20
Jack, lever, Simplex Ordnance and Engineer No. 315, or equivalent.		4			24		a, b, c	18
Lanterns.		30	6	12	210	100	a, b, c	20
Lanyards (gunners).		12	36		144	108	a, b, c	7
Level, testing, in case.		1			6	3	a, b, c	17
Mallet, hand.		4	2	1	30	12	a, b, c	7, 4
Mallet, long-handled.		4	2		30	12	a, b, c	18
Marking outfit for leather.		1	1	1	10	3	a, b, c	5
Marking outfit for metal.		1	1	1	10	3	a, b, c	5
Nail set.		1	1	1	10	6	a, b, c	5
Obturator spindle plate.						6	a, b, c	
Oilers, $\frac{1}{2}$ -pint, U46J 15-5-46.		5	1	1	34	24	a, b, c	4, 7
Oilers, horizontal.		4			24		a, b, c	
Oilstone, unmounted.		1	1	1	10	12	a, b, c	4
Pads, lantern bracket.		30	6	12	210	100	a, b, c	20
Paulins.		24	2	2	152	12	a, b, c	20
Pick.		15	4	6	108	36	a, b, c	20
Pick mattocks.		15	4	6	108	36	a, b, c	15
Pincers, solid steel, 8-inch.		1	1	1	10	12	a, b, c	4
Pinch bar.		4			24	2	a, b, c	18
Pistol-cleaning kit.		1	1	1	10		a, b, c	5
Pliers, cutting, 7-inch.		4	2		30	6	a, b, c	9
Plane, smoothing.		1	1	1	10	6	a, b, c	4
Plane, jack.		1	1	1	10	6	a, b, c	4
Pouches, gunners'.		4	2		30	6	a, b, c	7
Pocket, sponge staff.		6	2	2	44			
Primer flame baffle.						12	a, b, c	
<b>Punch:</b>								
Round, $\frac{1}{2}$ -inch, D.		1			6	3	a, b, c	13
Round, $\frac{1}{2}$ -inch, D.		1			6	3	a, b, c	13
Square.		1			6	3	a, b, c	13
Gunners'.		4	4		36	12	a, b, c	7
Pin.		4	4		36	12	a, b, c	7
Pritchell, $\frac{1}{2}$ -inch, flat.		1			6	3	a, b, c	13
Rake, fire.		1			6	3	a, b, c	13
Rasp, wood, 10-inch, half-round.		1			6	3	a, b, c	4
Rammer, head.		4	2		30	48	a, b, c	19
Rammer, staff.		4			24	48	a, b, c, d	19
Ratchet, drill, for square shank drills.		1			6	3	a, b, c	18
Reamer, cleaning, for primer seat.		4	4		36	12	a, b, c	7
Reamer, half-round.		1	1	1	10	6	a, b, c	4
Rivet sets, A, $\frac{1}{2}$ , $\frac{3}{4}$ , 1-inch (set).		1			6	3	a, b, c	13
Rope, 1 inch by 50 feet.		2	1	1	16	6	a, b, c	15
Rope, 1 inch by 100 feet.		4	1	1	28	12	a, b, c	
Rope, 1 inch by 150 feet.		2	1	1	16	6	a, b, c	15
Roll, canvas.		4	2		30	6	a, b, c	7
Rule, boxwood, 2-foot.		2	1	1	16	12	a, b, c	4, 13
<b>Saw:</b>								
Rip, 24-inch.		1	1	1	10	6	a, b, c	4
Crosscut, 24-inch.		1	1	1	10	6	a, b, c	4
Set.		1	1	1	10		a, b, c	
<b>Bar screw driver:</b>								
For gear segment screw, U45RB.		4	2		30	6	b	7
For obt. nut and P. pivot, U45U.		4	2		30	6	b	7
For latch lever and pivot screw, U45W.		4	2		30	6	a, c	7
General, U45N.		4			24	2	b	7
<b>Securing screw.</b>						12	a, b, c	
<b>Securing screw washer.</b>						12	a, b, c	
<b>Screw driver:</b>								
5-inch blade Commercial.		5	1	1	34	12	a, b, c	4, 7
U45AB.								
Commercial, 3-inch, blade, U45AN.		5	1	1	34	12	a, b, c	4, 7
General U56R*.		4			24	2	a, c	7
Elevating rack, U45PB*.		1			6	2	a, c	18
Obt. nut hinge lug plate screws U45AR.		4			24	2	a	7
For circuit-breaker housing, etc., U45Y.		4			24	6	a	7
Elevating rack bolts, U45Q*.		1			6	2	a	16

## TOOLS AND ACCESSORIES—Continued.

1	2	3	4	5	6	7	8	9
Article.	Article No.	Number for 1 battery.	Number for battalion headquarters.	Number for regimental headquarters.	Total for 1 regiment.	Spare at depot for 24 guns.	For gun or carriage No. —.	Carried in or on—
Screw plate, taps, dies, and tap wrench.....		1			6	3	a, b, c	13
Scraper, metal.....	4		2		30	12	a, b, c	7
Scraper, steel, with socket to fit sponge staff.....		4			48			18
Seal stamps.....		1	1	2	10	6	a, b, c	5
Shovel:								
Short-handle.....		15	4	6	108	24	a, b, c	20
Long-handle.....		15	4	6	108	24	a, b, c	20
Fire.....		1			6	3	a, b, c	13
Sledge, 11-pound.....		1			6	3	a, b, c	13
Sights, panoramic, complete, in original packing boxes:								
Model 1917.....	4				24	6	a, b, c	19
Bore, muzzle.....	1				6		a, b, c	1
Bore, breech.....	1				6		a, b, c	1
Spokeshave.....	1		1	1	10	6	a, b, c	4
Sponge and rammer, complete.....	4		4		36	48	a, b, c	19
Sponge, staff B.....	4		4		36	24	a, b, c	19
Sponge, staff E.....			8		72	24	a, b, c	19
Sponges, wagon.....	12		8		96	24	a, b, c	18
Splines, assembling, U28OA.....	2				12	2	c	18
Spline, assembling, U281A.....	2				12	2	c	18
Spline, assembling, U279A.....	2				12	2	b	18
Sleeves, gunners', pairs.....	4		8		48	24	a, b, c	7
Spring-rod extension.....	2				12		c	15
Spring-rod eye.....	2				12		c	15
Square, steel.....	2		1	1	16	9	a, b, c	4, 13
Straps:								
Ax.....		18	5	7	130	12	a, b, c	19
Hatchet.....		35	8	13	247	12	a, b, c	19
Lantern.....		35	7	14	245	12	a, b, c	19
Long shovel.....		18	5	7	130	12	a, b, c	19
Short shovel.....		18	5	7	130	12	a, b, c	19
Pick head.....		18	5	7	130	12	a, b, c	19
Pick handle.....		18	5	7	130	12	a, b, c	19
Stencil, Ordnance Department insignia.....	1		1	1	10	6	a, b, c	5
Stencil outfit.....	1		1	1	10	6	a, b, c	5
Stencil personal equipment.....	1		1	1	10	6	a, b, c	5
Tapeline, linen, 100 feet.....	1		1	1	10	12	a, b, c	4
Tongs for 1-inch iron.....	1				6	3	a, b, c	13
Tongs for 1/2-inch iron.....	1				6	3	a, b, c	13
Twine, assorted balls.....	16		6		114	18	a, b, c	18
Vise, table, 2 1/2-inch.....	1		1	1	10	6	a, b, c	4
Wrench:								
Monkey, 12-inch, U45G.....	4		4		36	12	a, b, c	7
Monkey, 15-inch, U45H.....	4		4		36	12	a, b, c	7
Monkey, 21-inch, U45L.....	4				24	2	a, b	7
Double-end, 1-inch and 0.75-inch, U43AY.....	4				24	2	a	7
Double-end stuffing-box and piston-rod nuts, U43AX.....	4				24	2	a	19
Spanner, stuffing box, U83BA.....	4				24	2	a, b, c	18
Single wrench, follower, and piston-rod, U43AB.....	4				24		b	19
Box, cylinder heads, U44B.....	4				24	2	b	18
Spanner, loading tray, latch nut, U44AA.....	4		4		36	12	a, c, d	7
Tit, obturator, U44Z.....	4		4		36	12	a, c, d	7
Spanner, recoil cylinder, U83A.....	1				6	2	c	18
Single-end, piston-rod, U43V.....	2				12	2	c	18
Single-end, recoil-cylinder head, U82N.....	1				6	2	c	18
Single, U43Q.....	4				24	2	a, b	7
Double-end, spindle and spring rod, U43NA.....	2				12	2	c	19
Double-end, piston-rod, cap, nut, and follower, U43MA.....	4				24	2	c	19

## Sec. 2.—TABLE OF WEIGHTS AND DIMENSIONS.

	Weights.			Dimensions.		
	5-inch.	6-inch A.	6-inch, 1917.	5-inch.	6-inch A.	6-inch, 1917.
Gun and band.....	7,703	19,922	21,931	21 x 36 x 240	42 x 30 x 320	36 x 44 x 320
Cradle and cylinders.....	2,540	5,780	8,023	26 x 36 x 70	40 x 51 x 100	32 x 51 x 100
Trail only.....	7,100	7,200	7,200	42 x 61 x 206	52 x 60 x 206	52 x 60 x 210
Axle.....	900	1,001	1,001	7 x 8 1/2 x 90	7 x 8 1/2 x 100	7 x 8 1/2 x 100
Wheel.....	2,650	2,650	2,650	21 x 73 x 73	21 x 73 x 73	21 x 73 x 73
Transport body.....		2,759	2,759		56 x 28 x 96	56 x 28 x 96
Transport wheel.....		2,650	2,650		21 x 73 x 73	21 x 73 x 73
Limber connection.....		466	466		46 x 20 x 80	46 x 20 x 80
Limber body.....	959	959	959	18 x 60 x 82	18 x 60 x 82	18 x 60 x 82
Limber wheel (1).....	930	930	930	10 x 61 x 61	10 x 61 x 61	10 x 61 x 61
Carriage, complete, with gun.....	23,543	39,202	43,455	{ W x H x L } 90 x 82 x 381	98 x 93 x 442	98 x 102 x 444
Carriage, complete, without gun.....	15,840	19,280	21,524	90 x 82 x 274	98 x 93 x 274	98 x 102 x 268
Transport and limber with gun.....		11,344	11,344		98 x 73 x 196	98 x 73 x 196
Transport alone without limber connection.....		31,266	33,275		98 x 73 x 418	98 x 73 x 418
Limber alone.....	2,819	2,819	2,819	82 x 61 x 86	82 x 61 x 86	82 x 61 x 86
15 T tractor.....	23,000	23,000	23,000	108 x 96 x 216	108 x 96 x 216	108 x 96 x 216
20 T tractor.....	26,000	26,000	26,000	108 x 96 x 240	108 x 96 x 240	108 x 96 x 240
Ammunition truck.....	8,000	8,000	8,000	80 x 90 x 216	80 x 90 x 216	80 x 90 x 216
Artillery supply truck.....	8,700	8,700	8,700	84 x 90 x 216	84 x 90 x 216	84 x 90 x 216
Artillery repair truck.....	14,600	14,600	14,600	84 x 120 x 228	84 x 120 x 228	84 x 120 x 228
				84 x 141 x 228	84 x 141 x 228	84 x 141 x 228

<sup>1</sup> Dimension with the top raised.

WAR DEPARTMENT,

OFFICE OF THE CHIEF OF ORDNANCE,

Washington, November 23, 1917.

Form No. 1680.

Ed. Nov. 23—17—1,000.

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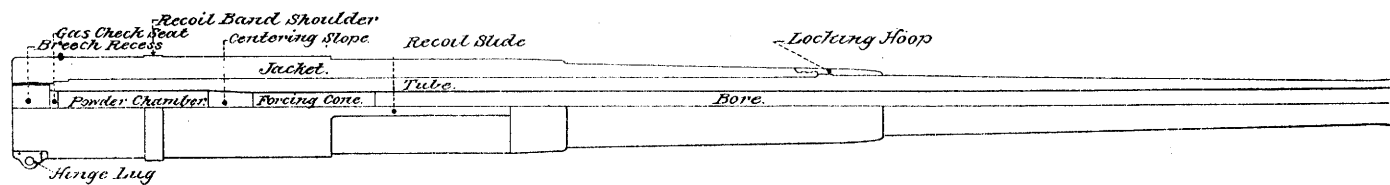
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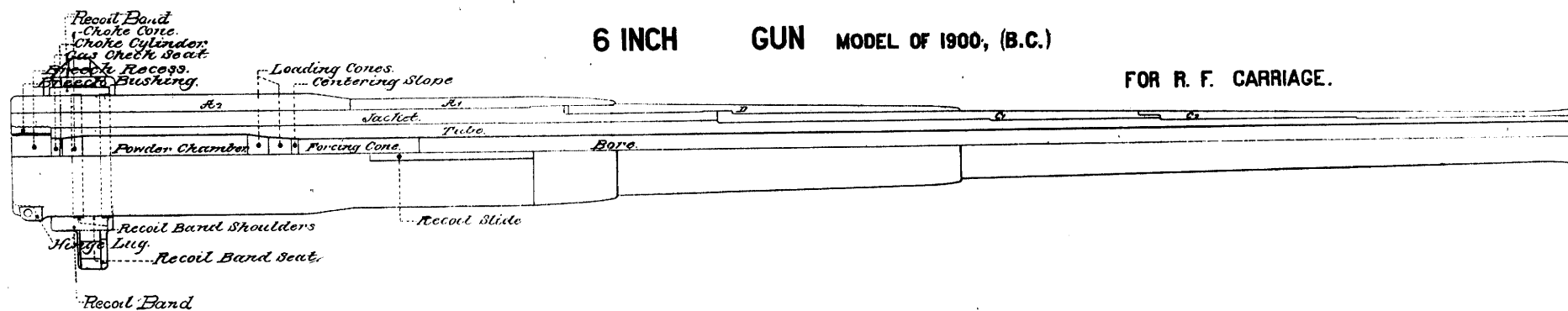
# 5 INCH GUN MODEL OF 1897.

PLATE I

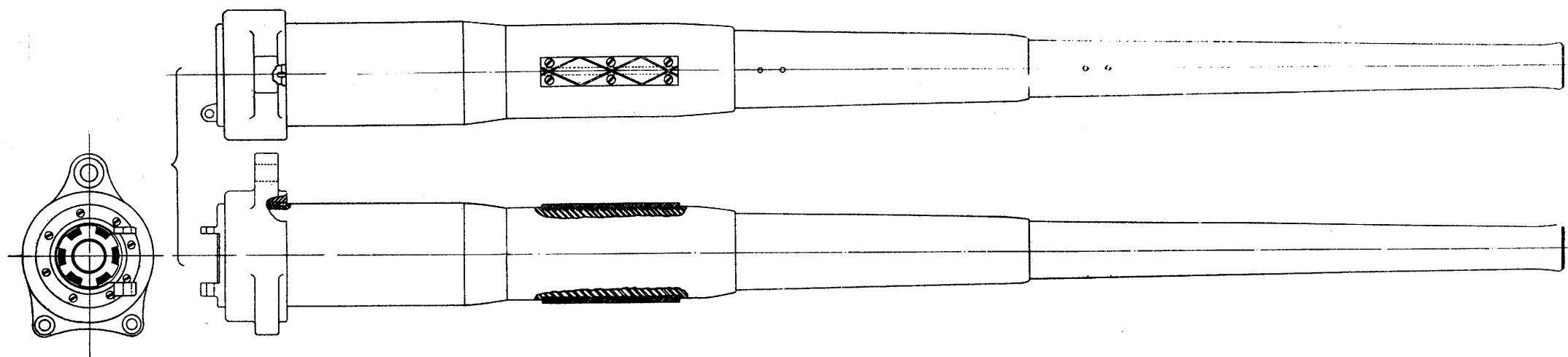


# 6 INCH GUN MODEL OF 1900, (B.C.)

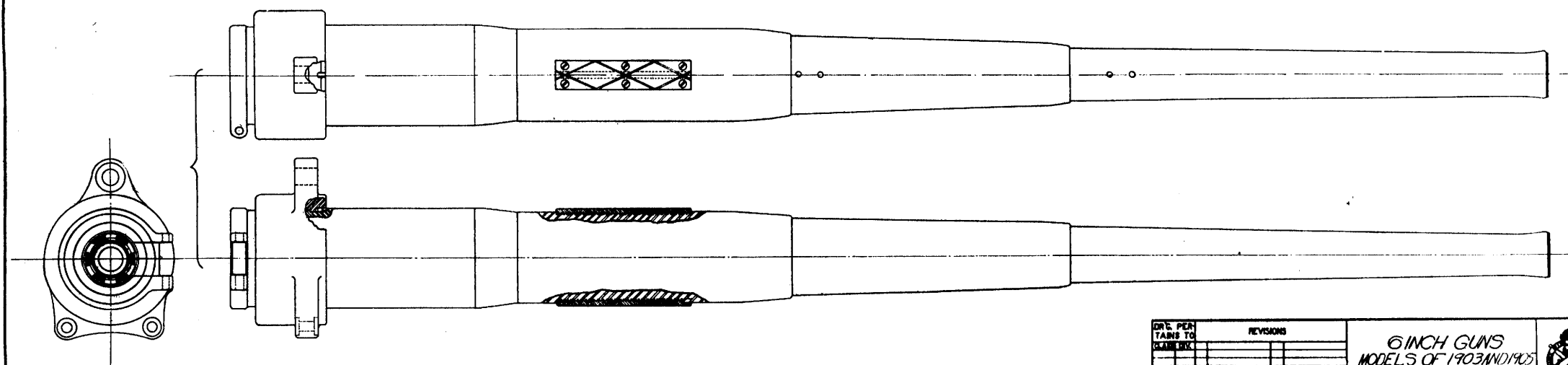
FOR R. F. CARRIAGE.




CLASS 36	DIVISION 6	DRAWING 1	FILE
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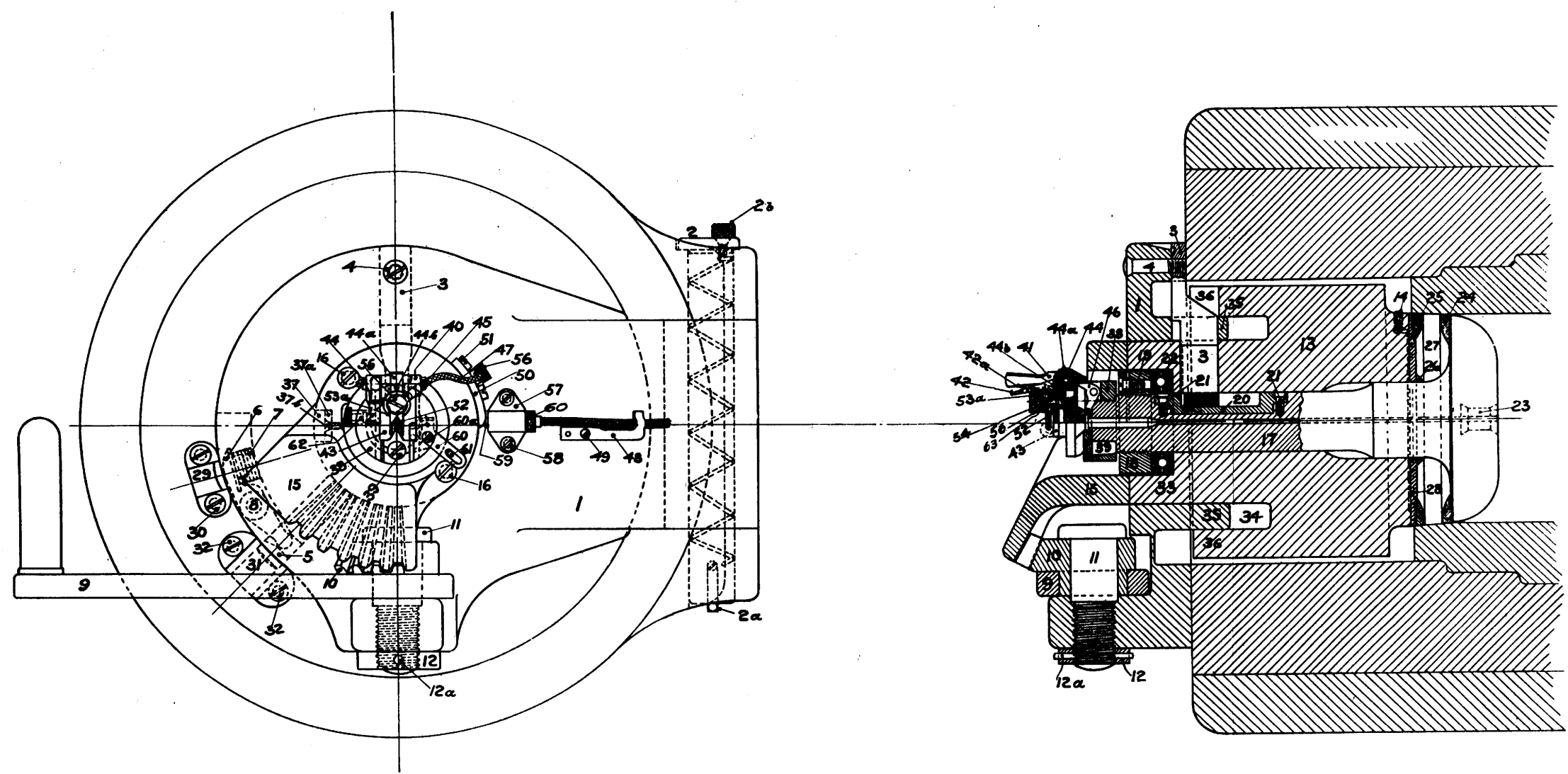
## 6 IN. GUN MODEL OF 1905



DATE PER TAINS TO CLAIMING	REVISIONS		6 INCH GUNS MODELS OF 1903 AND 1905 ILLUSTRATION SHEET		
			SUBMITTED:		APPROVED BY ORDER OF THE CHIEF OF ORDNANCE
			ORDNANCE DEPARTMENT U.S.A. EXAMINED:		
			ORDNANCE DEPARTMENT U.S.A.		ORDNANCE DEPARTMENT U.S.A.
CLASS 36		DIVISION 6	DRAWING 41	FILE	



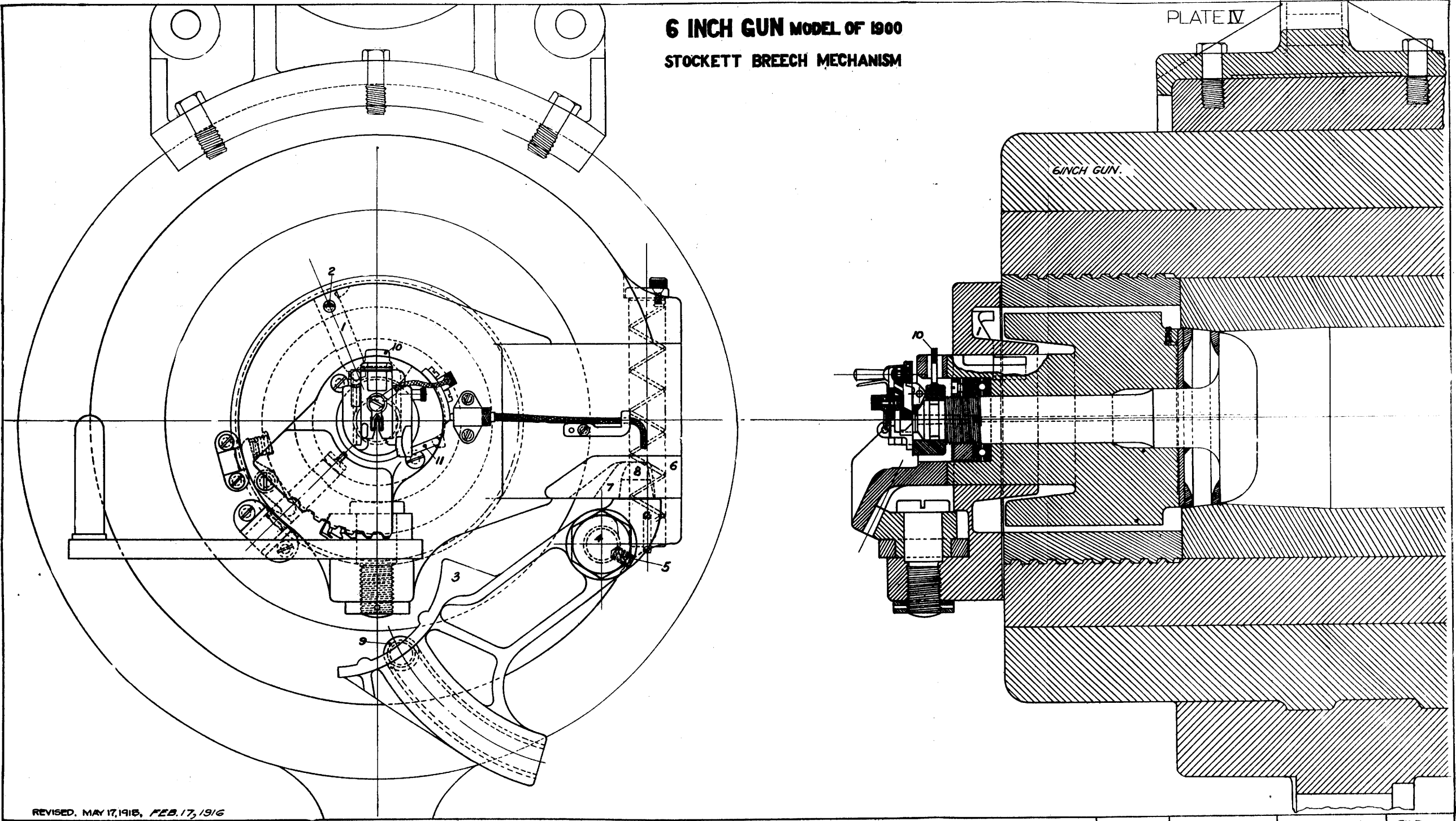
# 5 INCH GUN MODEL OF 1897 STOCKETT BREECH MECHANISM



REVISED MAY 17, 1913, FEB. 17, 1916.

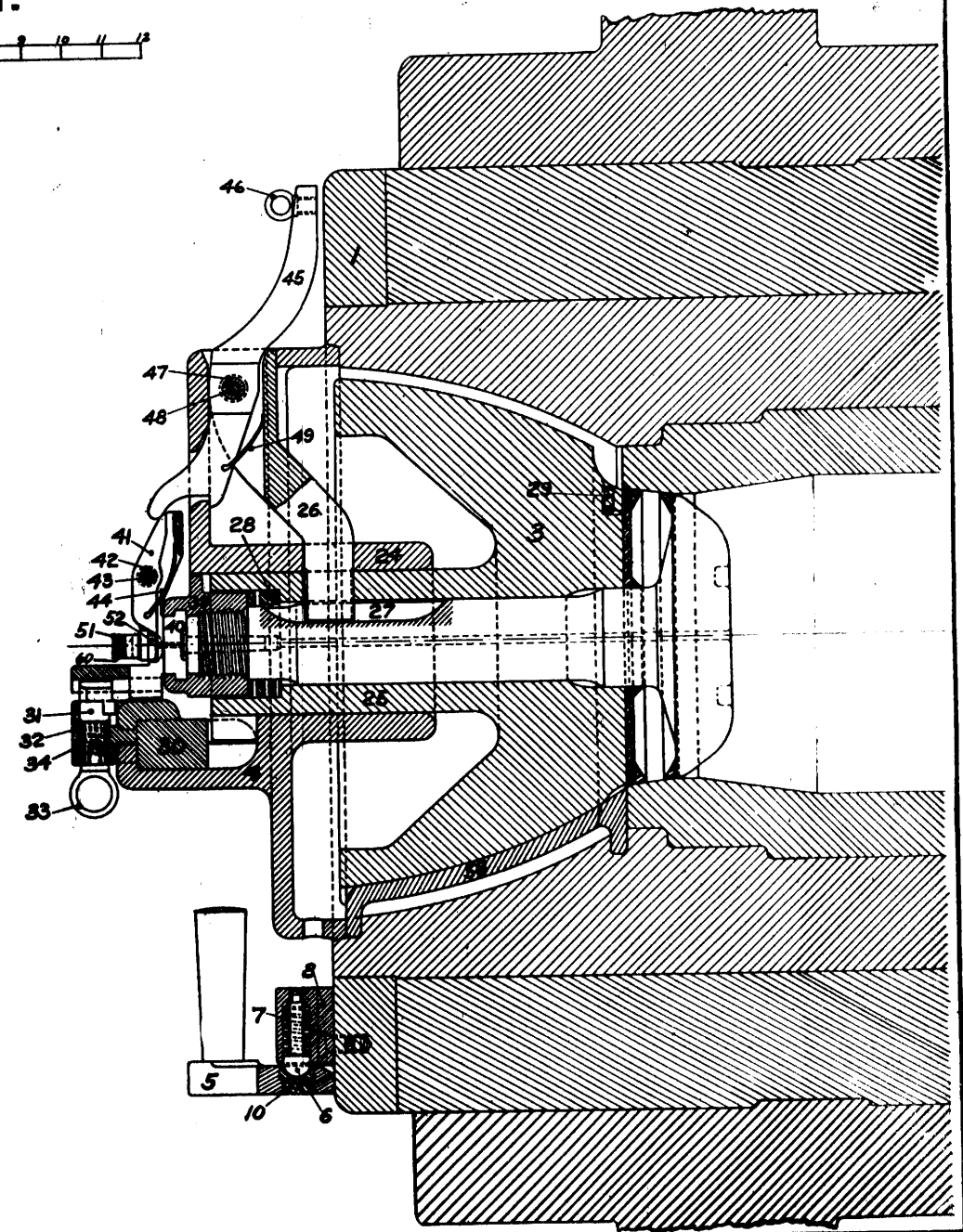
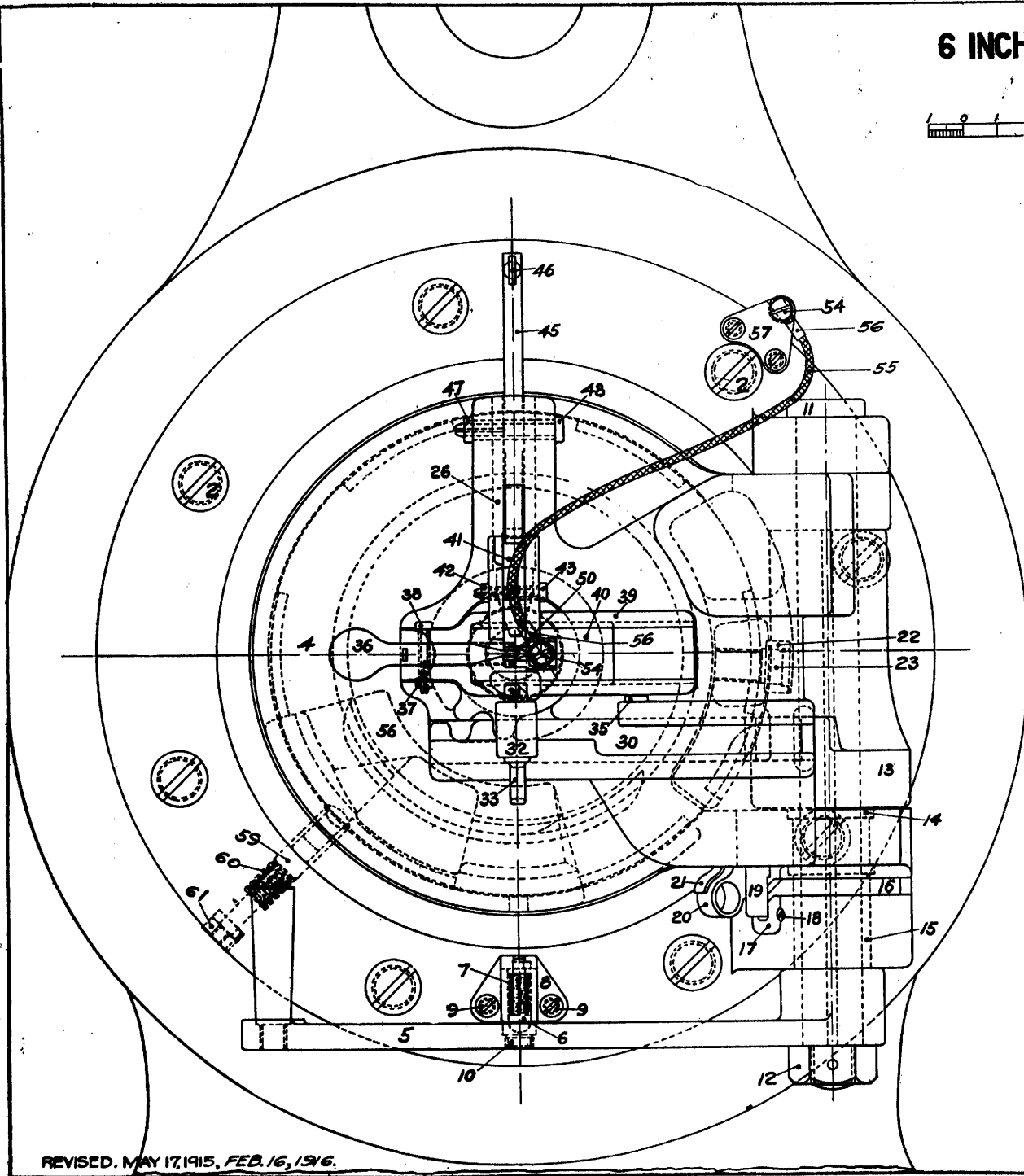
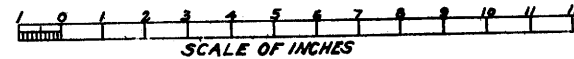
**6 INCH GUN MODEL OF 1900**  
**STOCKETT BREECH MECHANISM**

PLATE IV



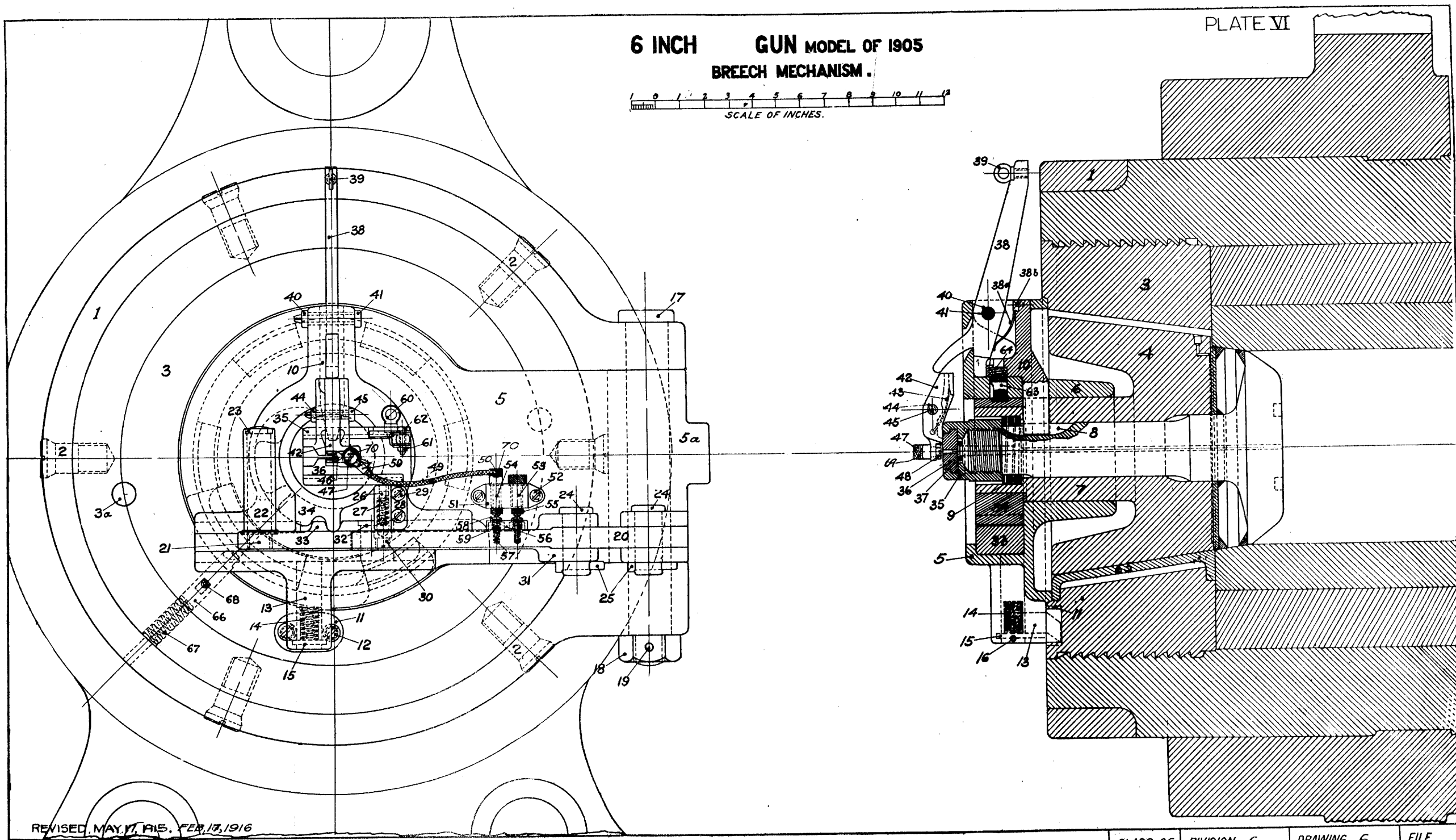
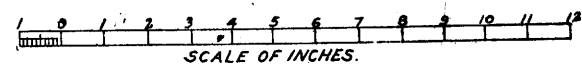
REVISED. MAY 17, 1915, FEB. 17, 1916

6 INCH GUN MODEL OF 1903  
BREECH MECHANISM.



REVISED. MAY 17, 1915, FEB. 16, 1916.

6 INCH GUN MODEL OF 1905  
BREECH MECHANISM.



REVISED MAY 17, 1915. FEB 17, 1916

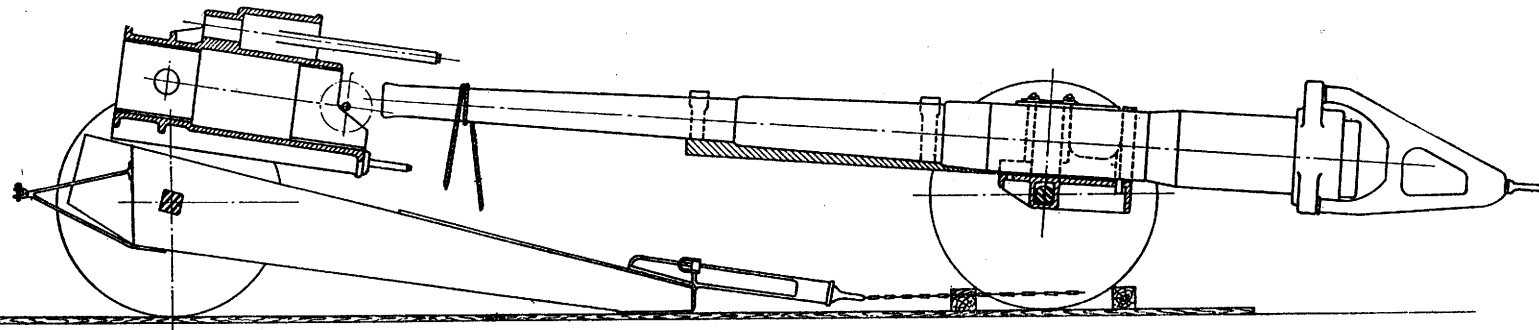


FIG. 1.

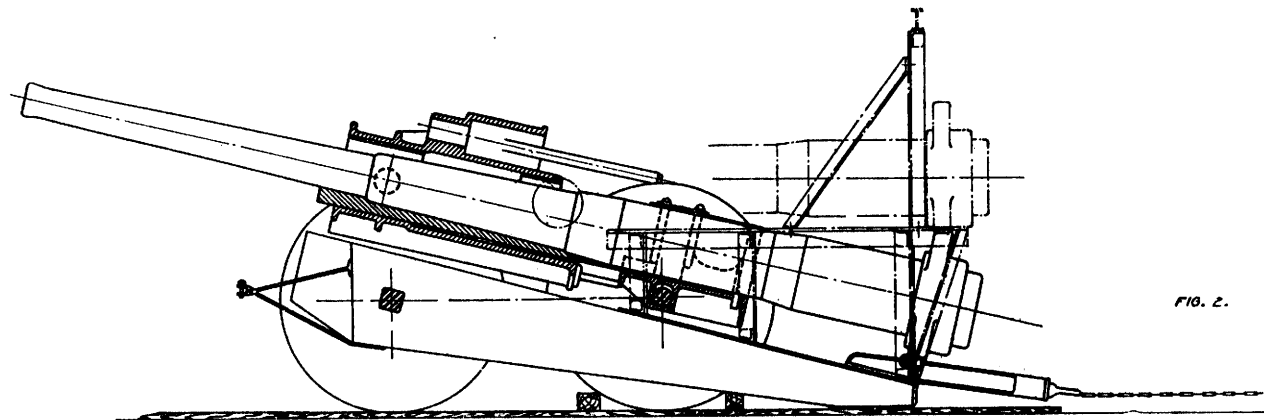


FIG. 2.

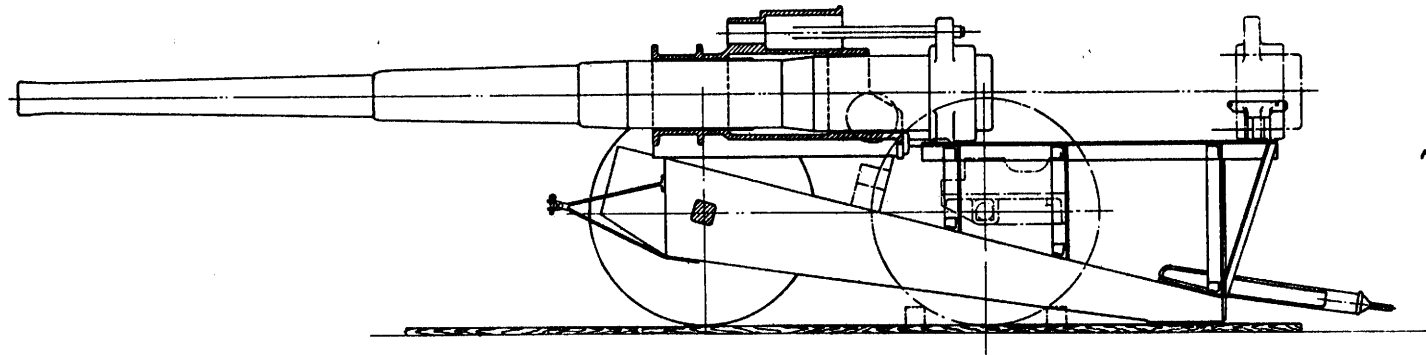
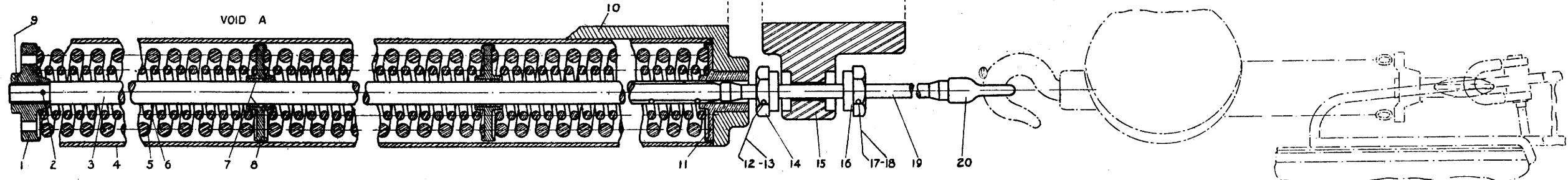


FIG. 3.

0 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 INCHES

ORG. PERTAINS TO CLASS 3	REVISIONS		6. INCH GUN CARRIAGE MODEL OF 1917 MOUNTING ARRANGEMENT.	
	DATE	BY		
			SUBMITTED: H. Miller	NOV. 20, 1917.
			APPROVED BY CHIEF OF THE CHIEF OF BUREAU: J. C. Miller	
			ORDNANCE DEPARTMENT, U.S.A.	
CLASS 3	DIVISION 50	DRAWING 6	FILE	

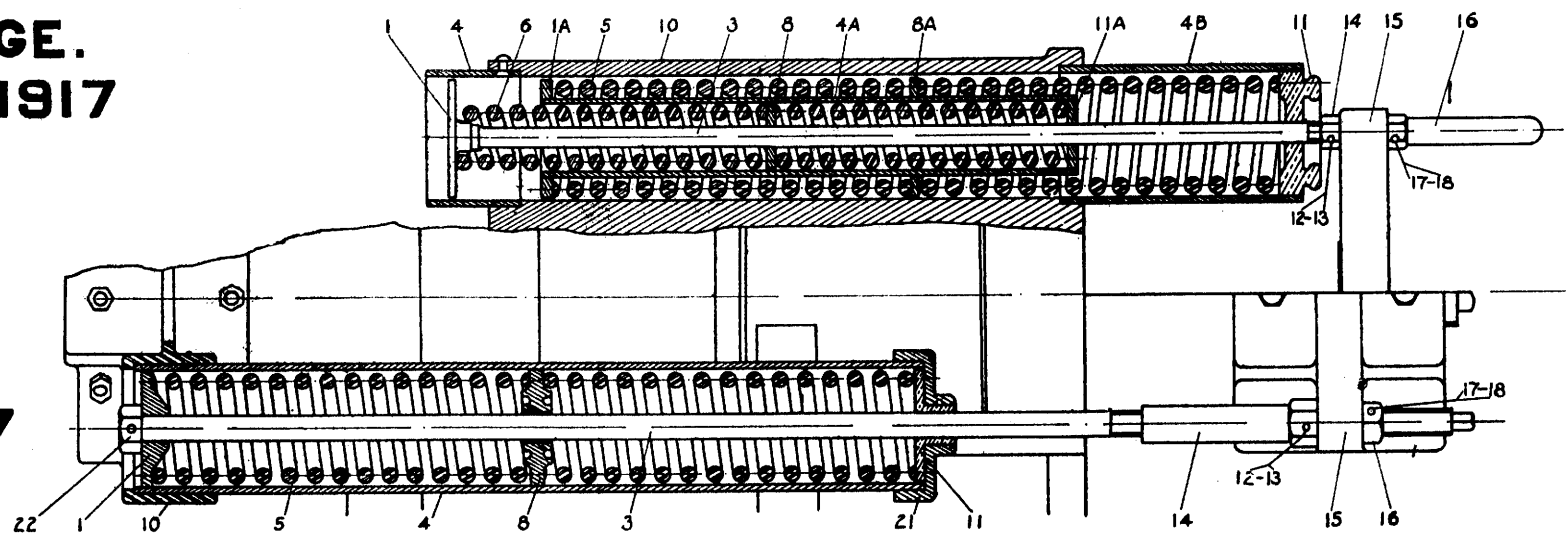
# COUNTER RECOIL MECHANISMS



**6" CARRIAGE.  
MODEL OF 1917**

**FIG. 1**

**6" CARRIAGE.  
MODEL OF 1917  
TYPE A**

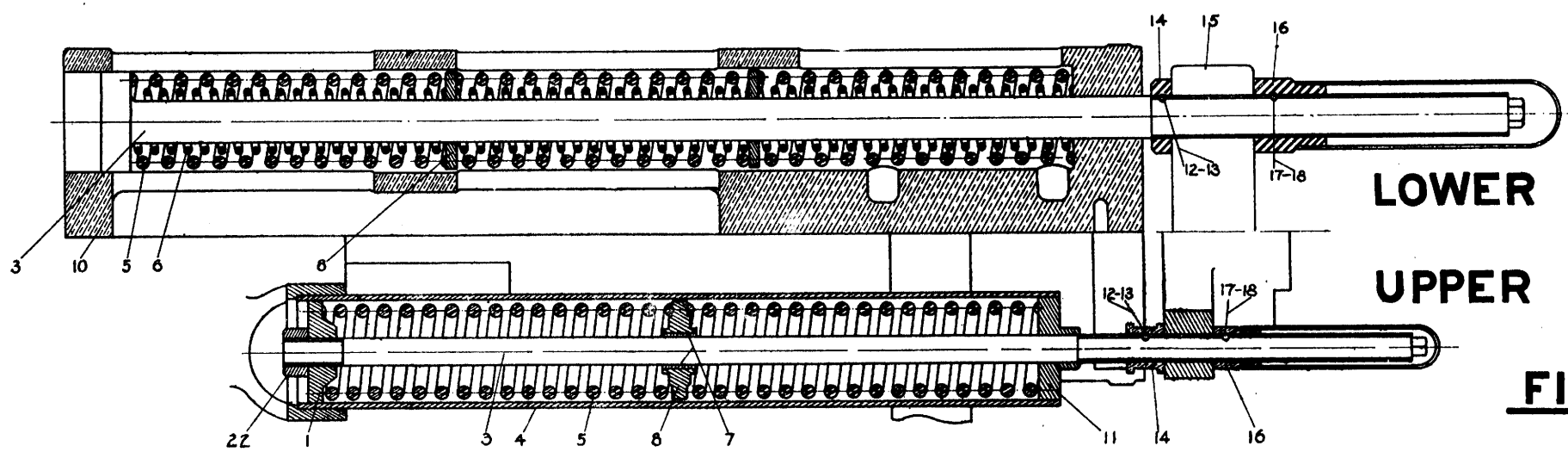


LOWER

UPPER

**FIG. 2**

**5" CARRIAGE.  
MODEL OF 1917**



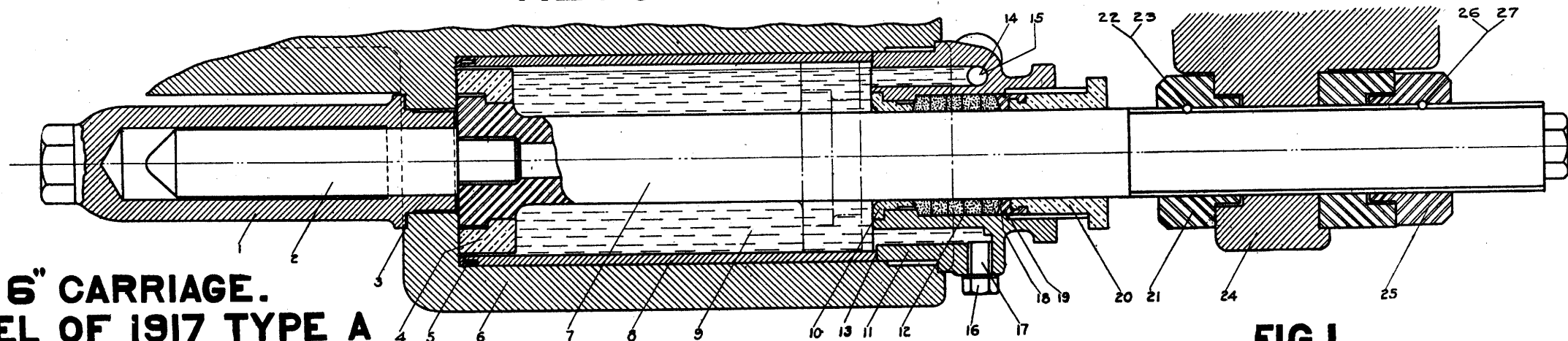
LOWER

UPPER

**FIG. 3**

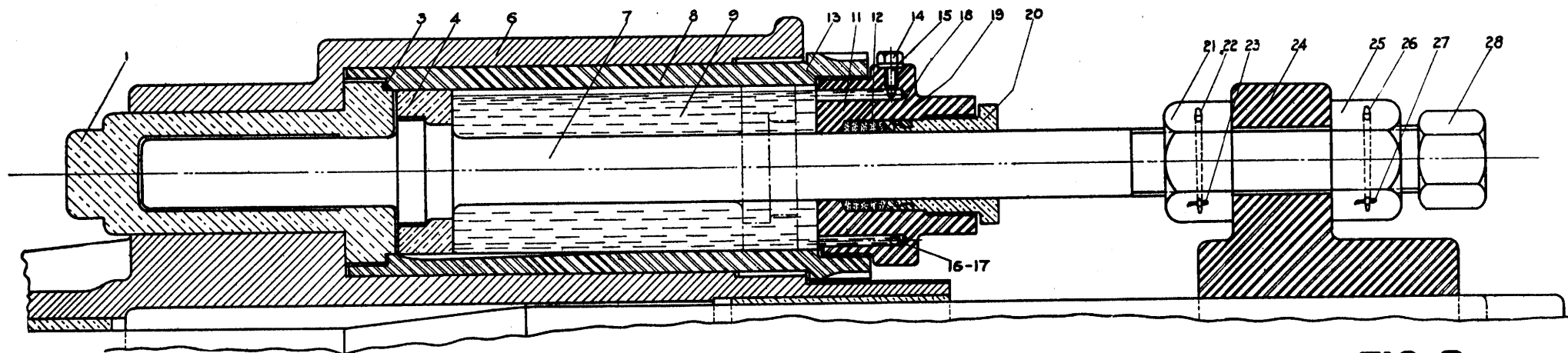
# RECOIL MECHANISMS

**6" CARRIAGE.  
MODEL OF 1917 TYPE A**



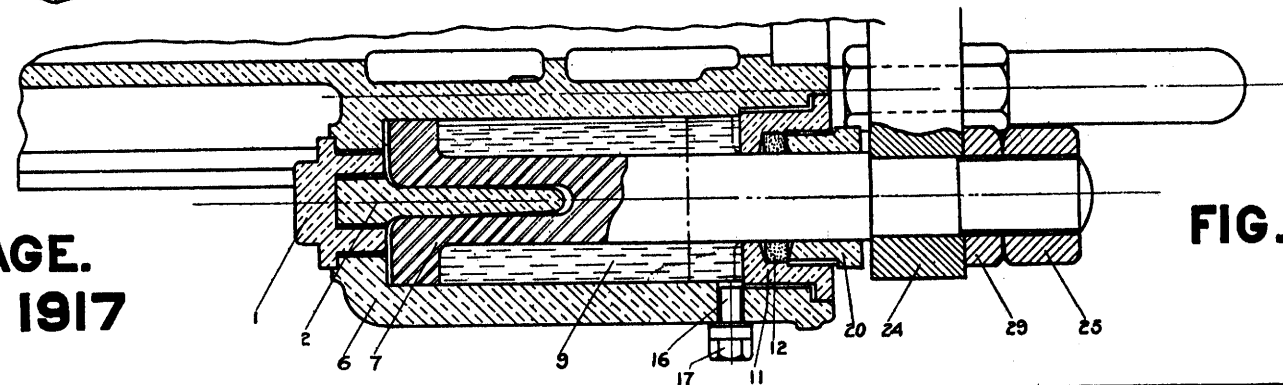
**FIG. 1**

**6" CARRIAGE.  
MODEL OF 1917**



**FIG. 2**

**5" CARRIAGE.  
MODEL OF 1917**



**FIG. 3**



# ELEVATING MECHANISM

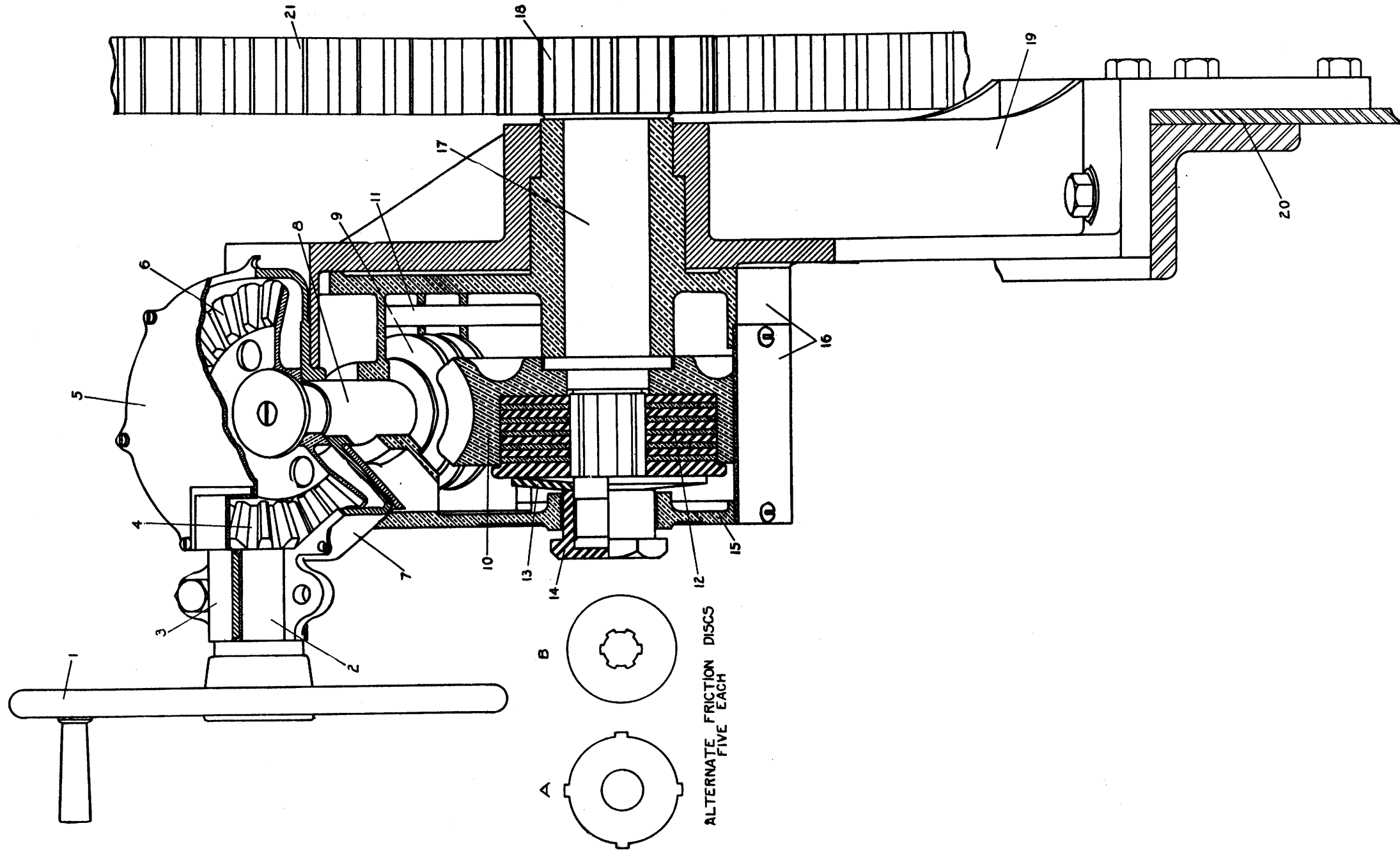
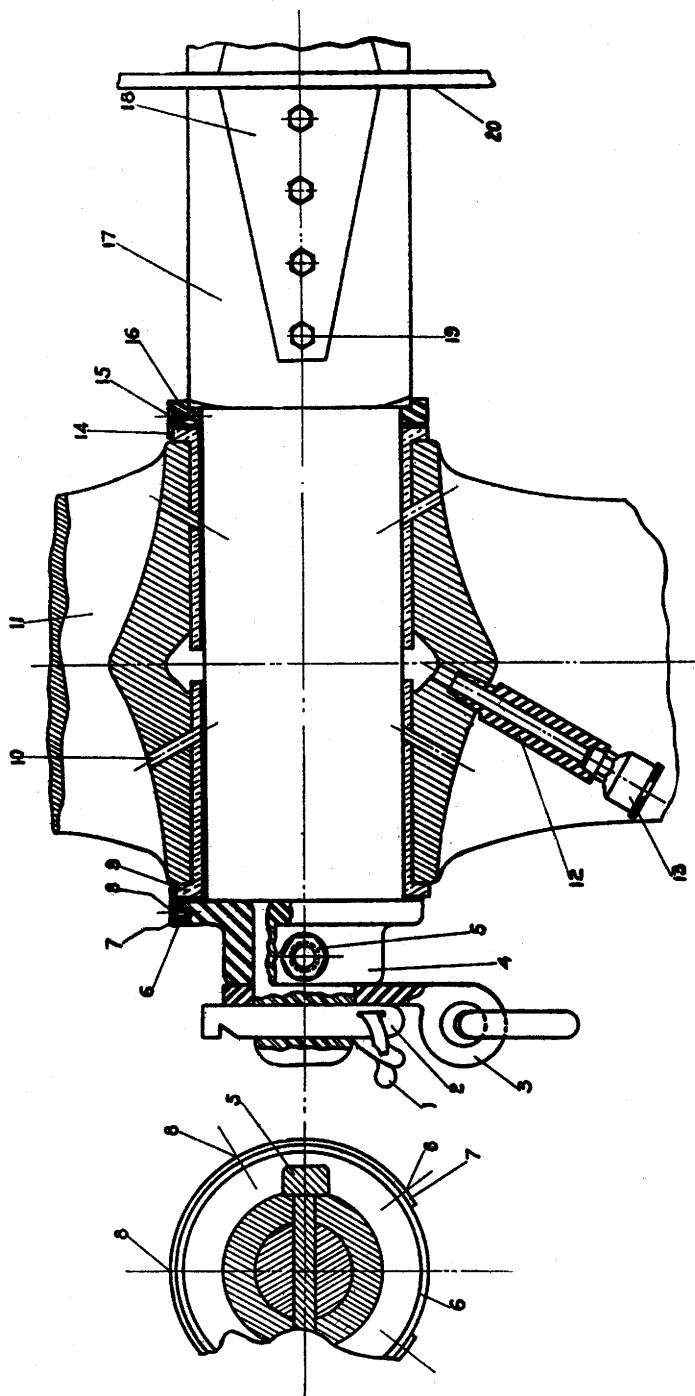
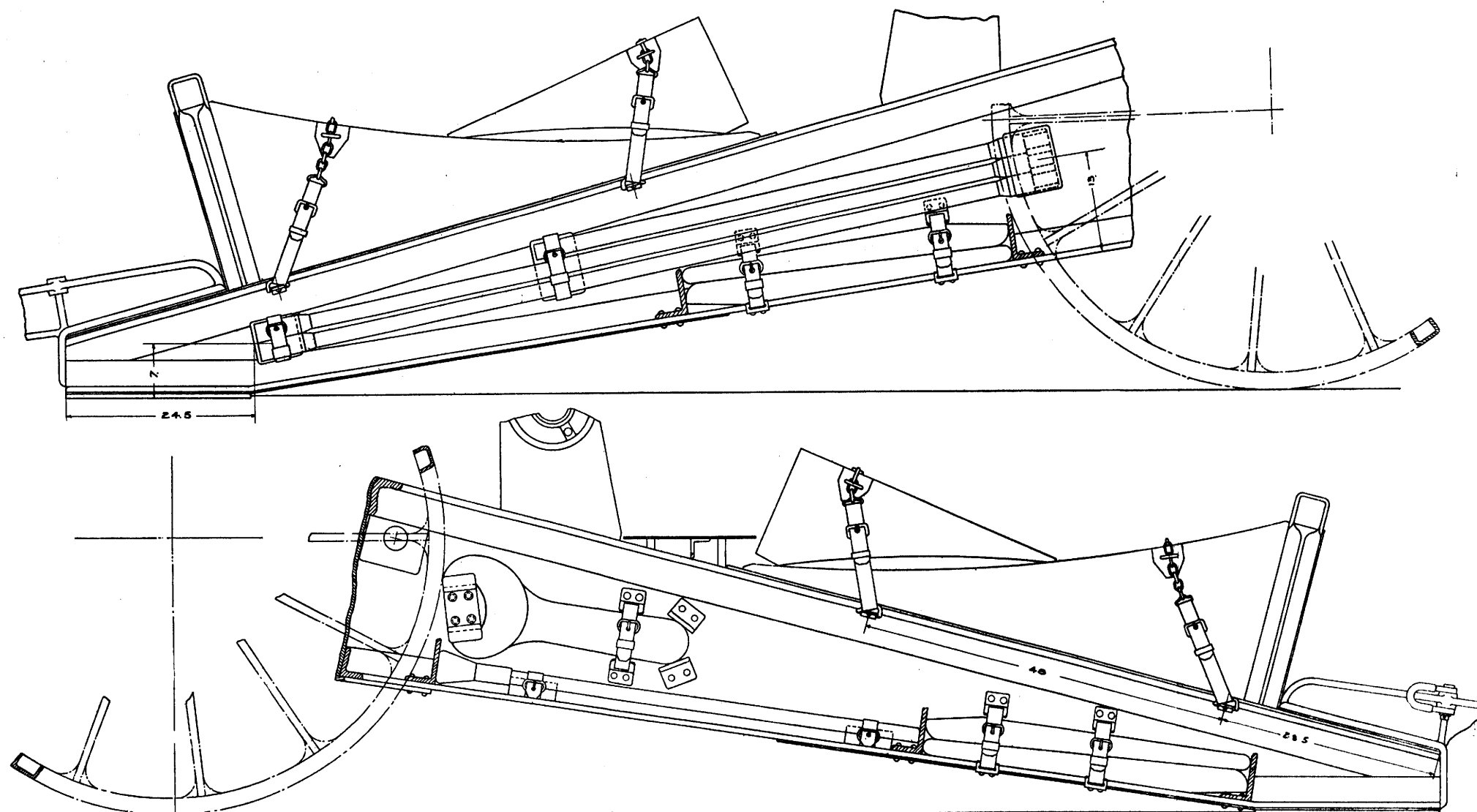





PLATE XI

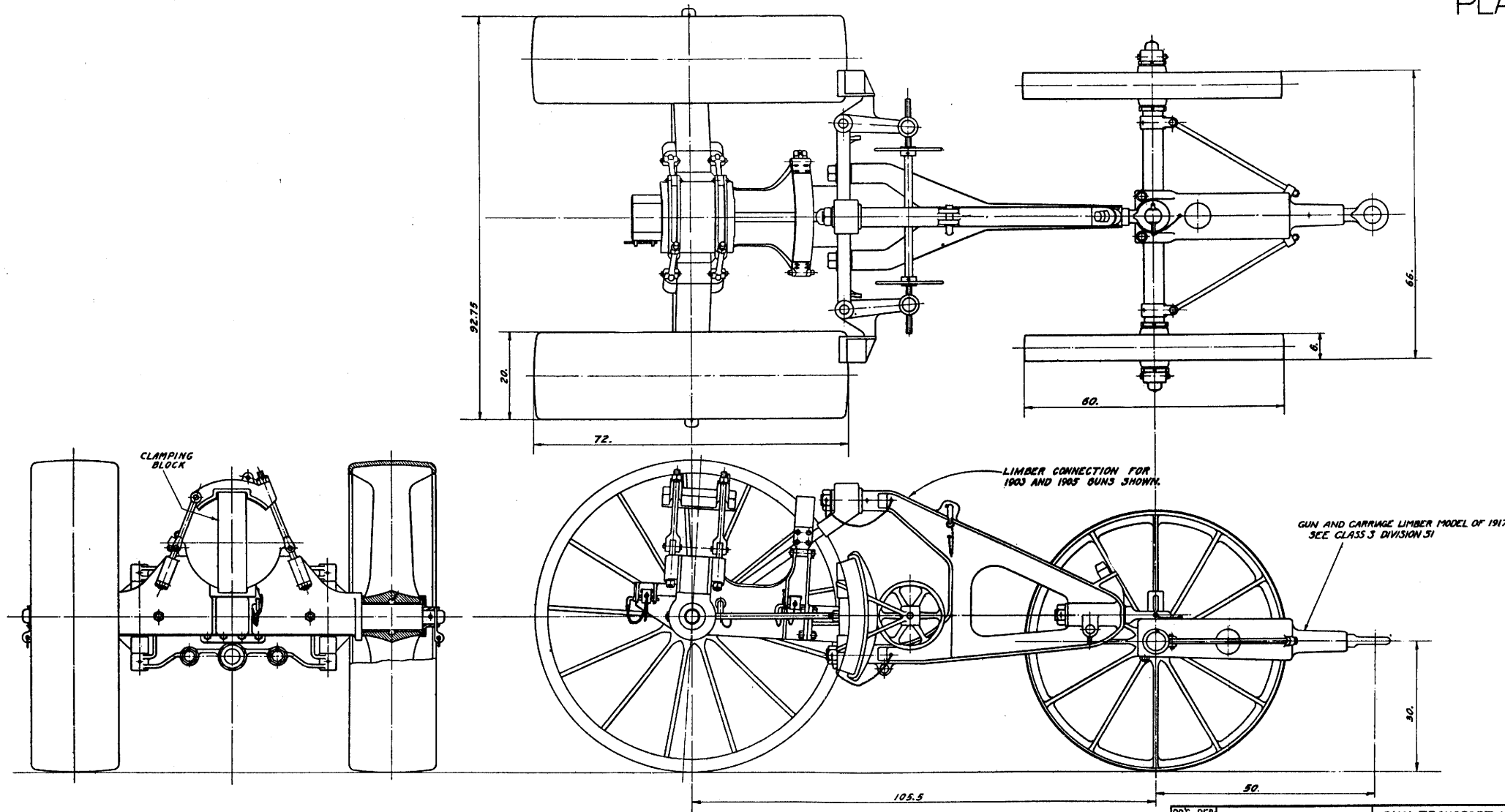
# CARRIAGE WHEEL HUB





0 6 8 12 16 20 24 28 32 36 40 44 48 52 56 60 64 68 INCHES

D.R.C. PERTAINS TO CLASS REV.	REVISIONS		6 INCH GUN CARRIAGE MODEL OF 1917 TYPE A METHOD OF CARRYING TOOLS ON TRAIL	 NOV. 17, 1917
	DEC. 24, 1917			
			SUBMITTED BY:  CAPTAIN, ORDNANCE DEPARTMENT, USA	APPROVED BY:  MAJOR, ORDNANCE DEPARTMENT, USA
			ORDNANCE DEPARTMENT, USA	ORDNANCE DEPARTMENT, USA
	CLASS 3	DIVISION 54	DRAWING 3	FILE



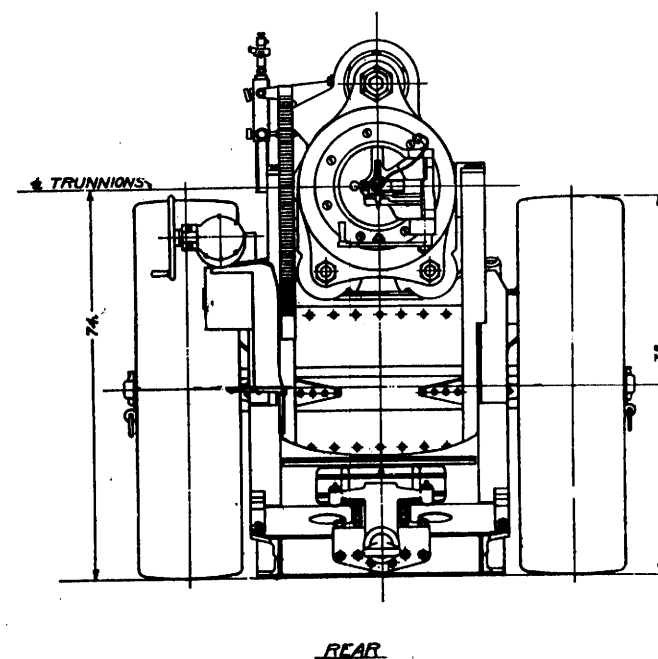
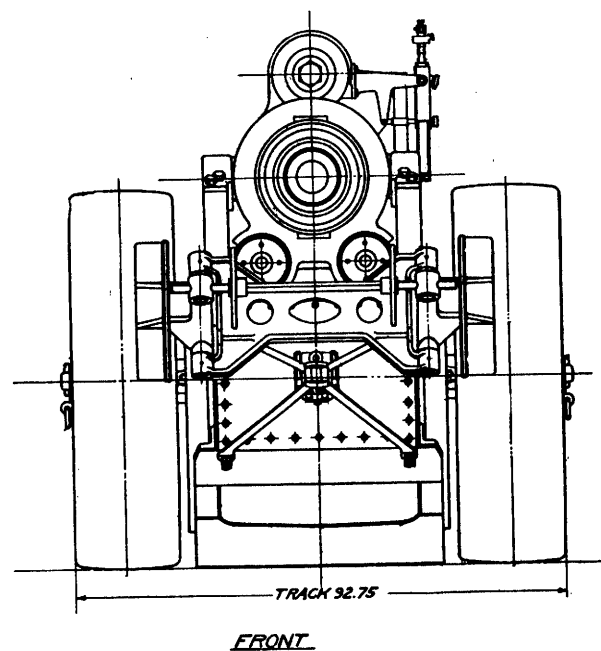
0 10 20 30 40 50 60 70 80 90 100 110 INCHES.


REV. PER TAINS TO		REVISIONS		GUN TRANSPORT WAGON MODEL OF 1917 ASSEMBLY WITHOUT GUN		SEPT 22 1917	
CLASS	DIV.	REV.	DATE	BY	CHKD.	APPROVED	FILE
CLASS 3	DIVISION 52	DRAWING 3					

DESIGNED BY: *R. J. W.*  
 CHECKED BY: *W. J. W.*  
 APPROVED BY: *W. J. W.*  
 SPECIAL AGENT IN CHARGE OF INVESTIGATION



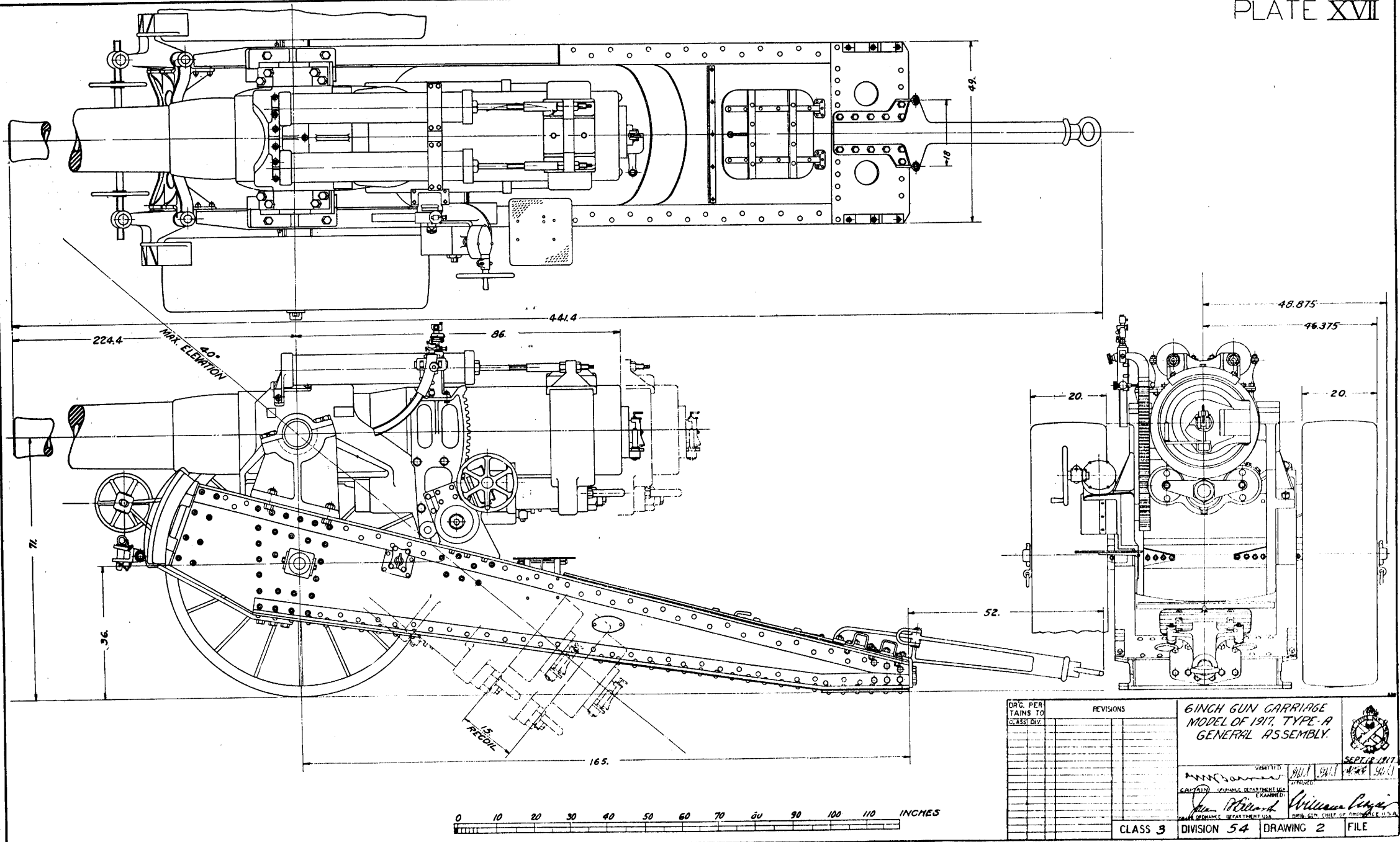


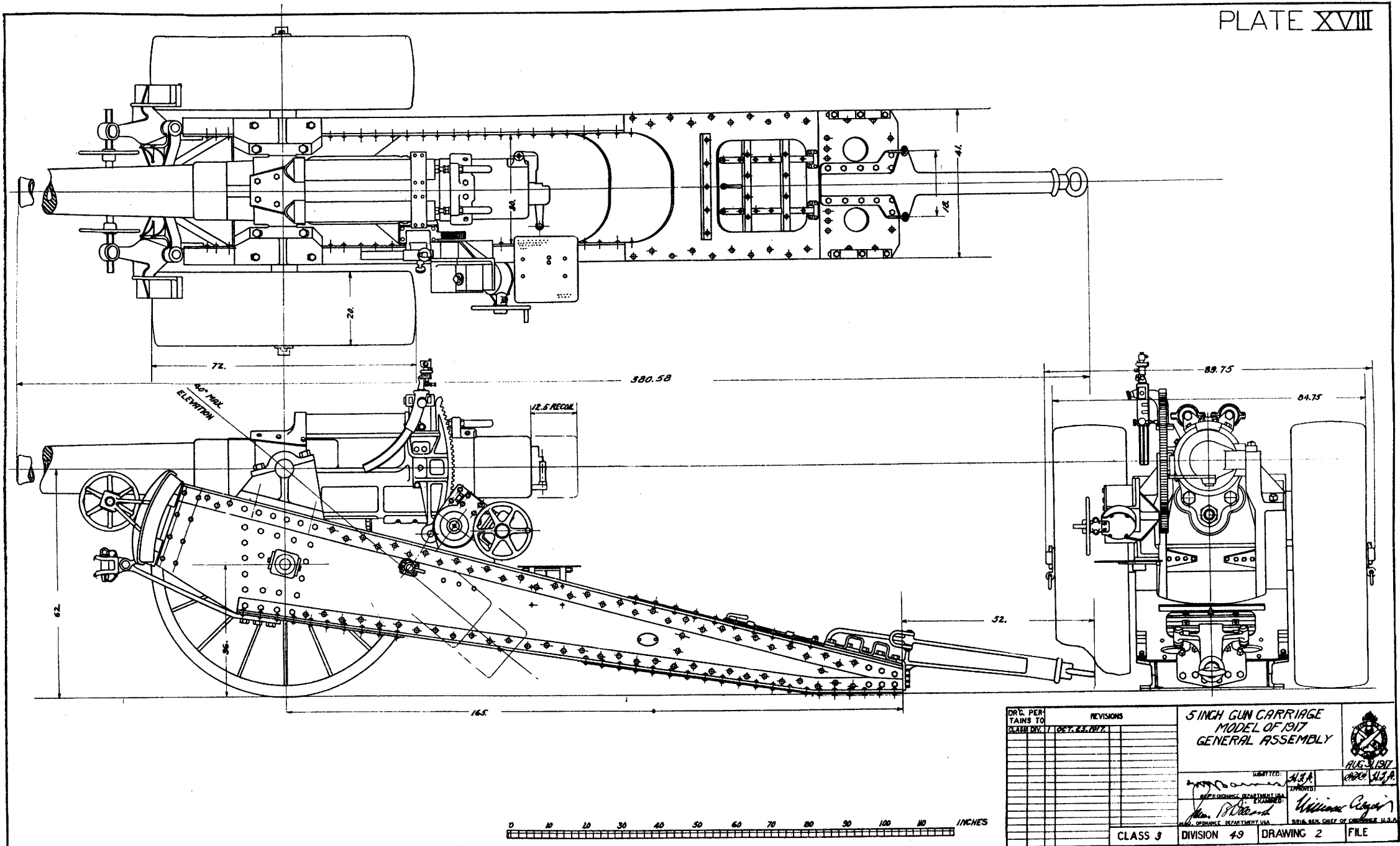


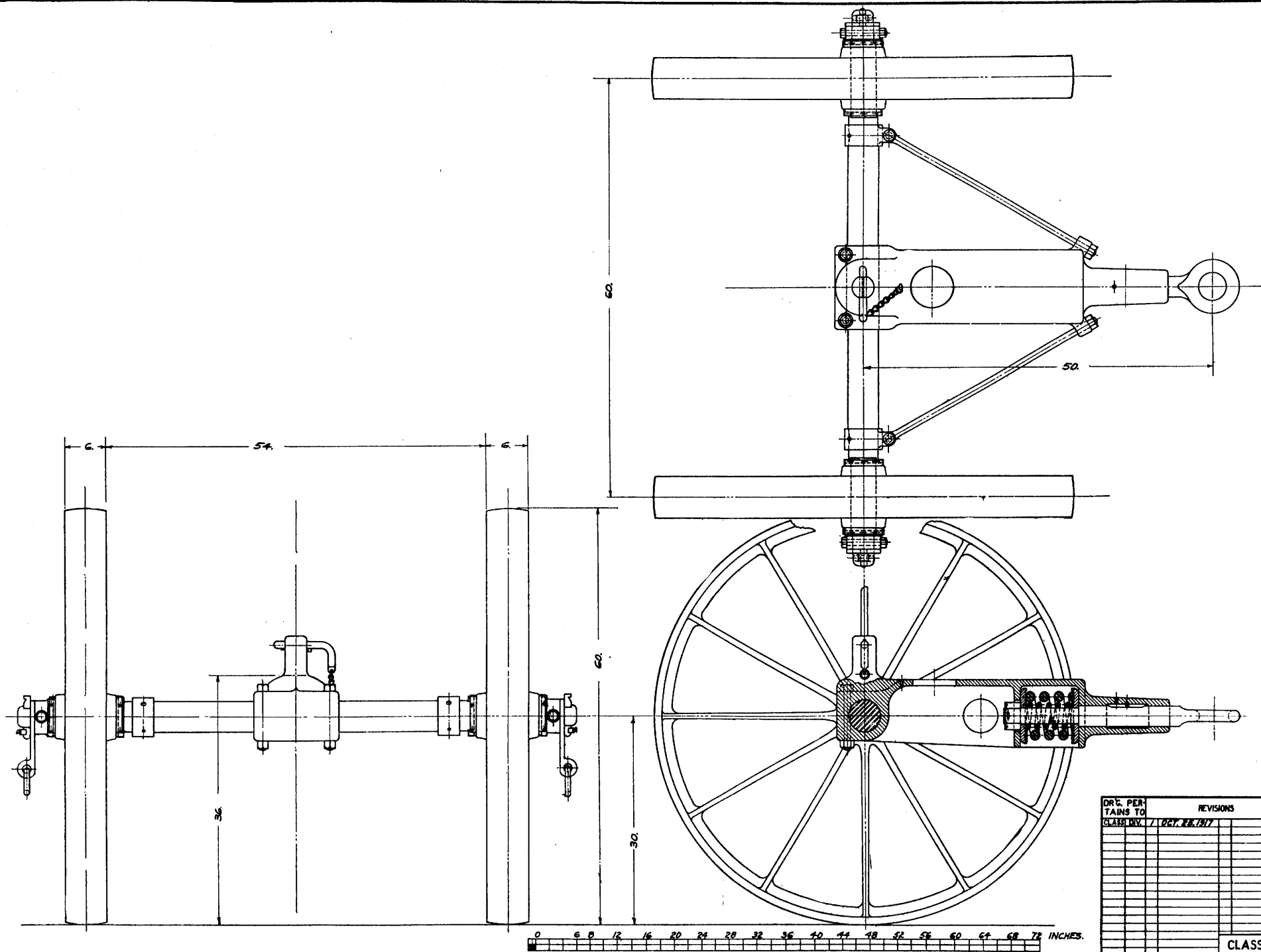
ORC. PER- TAINS TO CLASS DIV.	REVISIONS		6 INCH GUN CARRIAGE MODEL OF 1917 ELEVATION FRONT AND REAR		
CLASS 3			DIVISION 50	DRAWING 4	FILE

DESIGNED BY: *C. J. BERN*  
 CHECKED BY: *W. H. BROWN*  
 APPROVED BY: *W. H. BROWN*  
 DATE: *SEPT 13, 1917*  
 ORDNANCE DEPARTMENT, U.S. ARMY









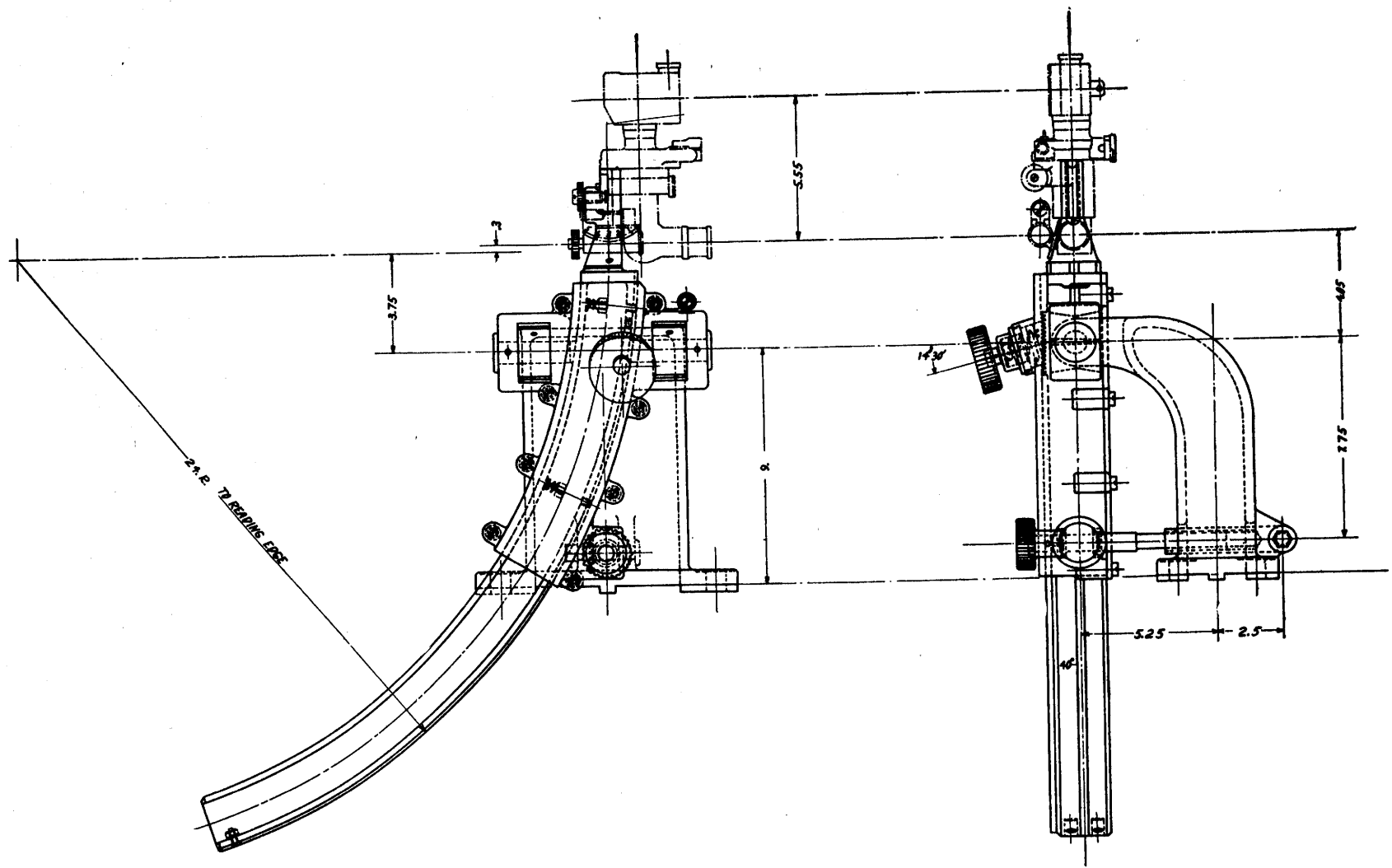
DRG. PER TAINS TO CLASS. REV. 1 OCT. 28, 1917		REVISIONS		GUN AND CARRIAGE LIMBER MODEL OF 1917 GENERAL VIEWS		
				SUBMITTED: 2182200 N. 8. 1917 APPROVED: <i>William C. Coe</i> LT. COL. ORDNANCE DEPARTMENT, USA HEAD ORDNANCE DEPARTMENT, USA		
				CLASS 3		DIVISION 57
				DRAWING 2		FILE

# PLATE XX

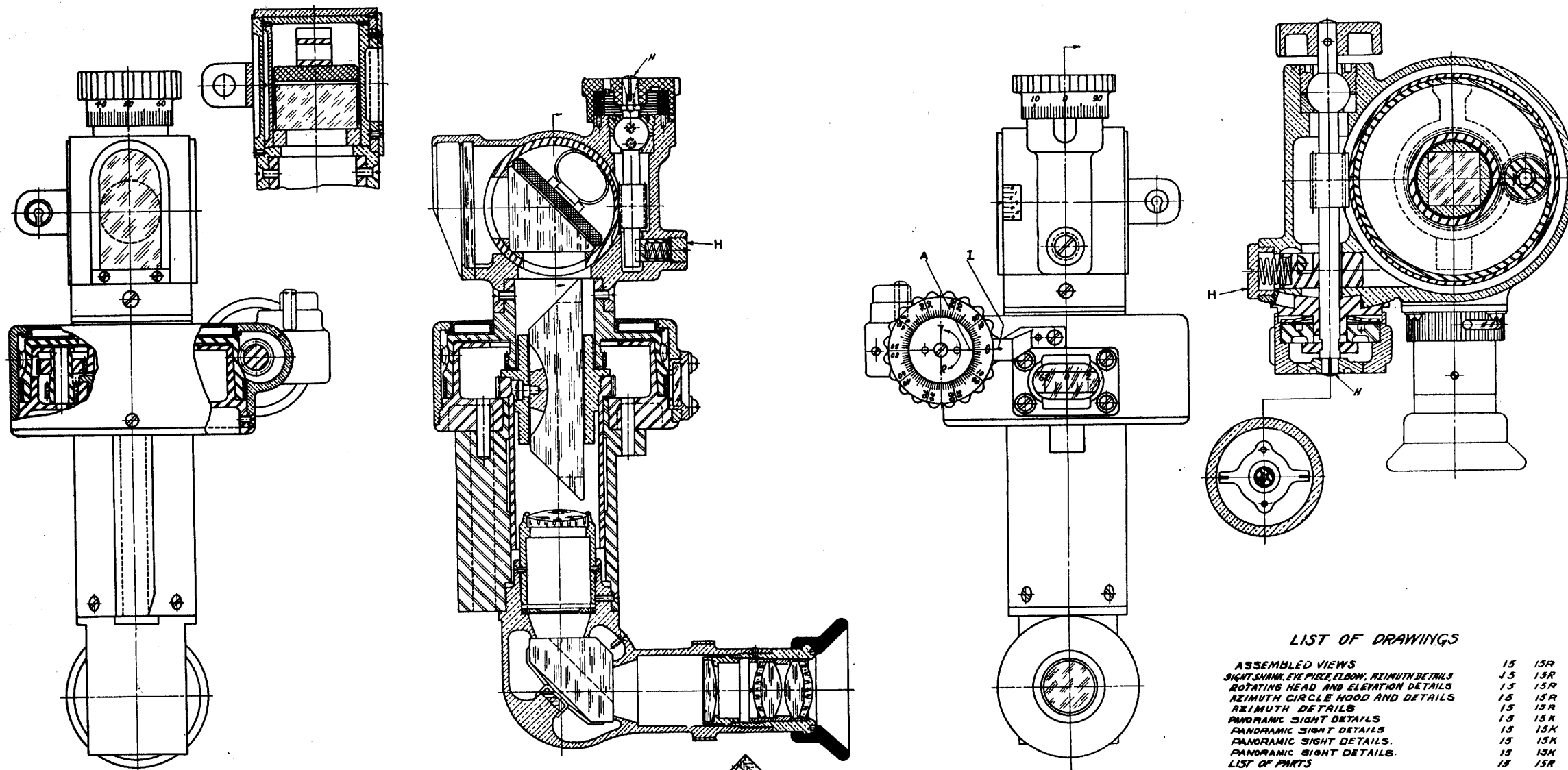
## LIST OF DRAWINGS

## CLASS DIV. DRG.

ASSEMBLED VIEW	15	15U	1
LIST OF PARTS	15	15U	1A
SIGHT SHANK AND DETAILS	15	15U	2
SHANK SOCKET AND DETAILS	15	15U	3
SHANK BRACKET (FOR CL. 3 DIV. 10 & CL. 3 DIV. 34) AND DETAILS	15	15U	4
LEVELING DETAILS (LOWER)	15	15U	5
SCROLL GEAR DETAILS	15	15K	2
DETENT DETAILS	15	15K	3
SPRING PLATE AND LEVEL DETAILS	15	15K	4
LEVEL DETAILS	15	15K	5
RANGE STRIP DETAILS	15	15K	6
HANDY OILER	30	2	2
SIGHT BRACKET (FOR CL. 3 DIV. 30)	15	15U	6

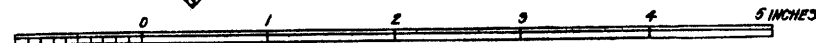


<p>DRG. PER TAINS TO</p> <p>CLASS DIV. 15U</p>		<p>REVISIONS</p> <p>1 SEPT. 2, 1917</p>		<p>SIGHT MODEL OF 1918 ASSEMBLY</p>		<p>AUG. 30, 1917</p>	
<p>APPROVED:</p> <p><i>[Signature]</i></p>		<p>APPROVED:</p> <p><i>[Signature]</i></p>		<p>APPROVED:</p> <p><i>[Signature]</i></p>		<p>APPROVED:</p> <p><i>[Signature]</i></p>	
<p>CLASS 15</p>		<p>DIVISION 15U</p>		<p>DRAWING 1</p>		<p>FILE</p>	



NOTE—ALL EXPOSED METALLIC SURFACES NOT SUBJECT TO FRICTION (EXCEPT SCALES) TO BE GIVEN TWO COATS OF OLIVE DRAB BAKING ENAMEL AND ONE COAT CRYSTALLIZING BAKING VARNISH. INTERIOR METALLIC SURFACES EXPOSED TO RETRACTED LIGHT TO BE GIVEN A DULL FINISH BUT NOT PAINTED. ALL EXTERIOR JOINTS TO BE ASSEMBLED WITH LITHARGE CEMENT.

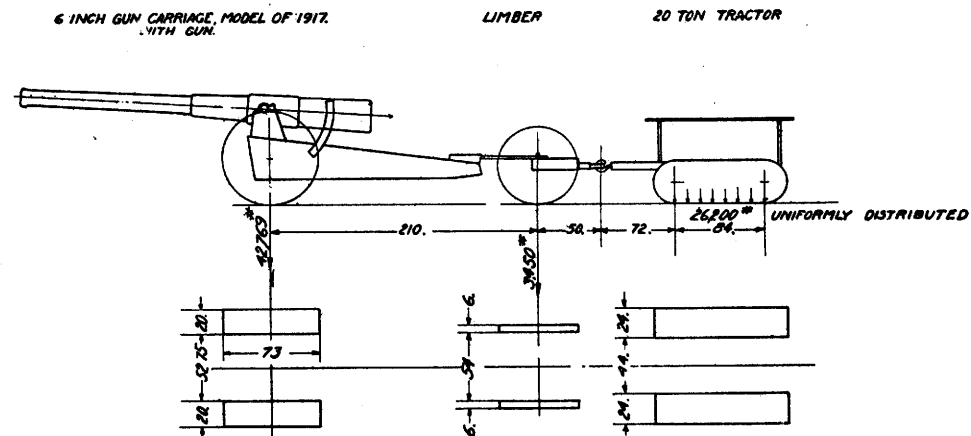
SHELLAC THREADS AND UNDER HEAD, STAKE, FILL SLOTS WITH PUTTY AND LACQUER SO THAT SCREWS ARE INVISIBLE, EXCEPT SCREWS MARKED "H" WHICH REQUIRE ADJUSTMENT IN SERVICE.



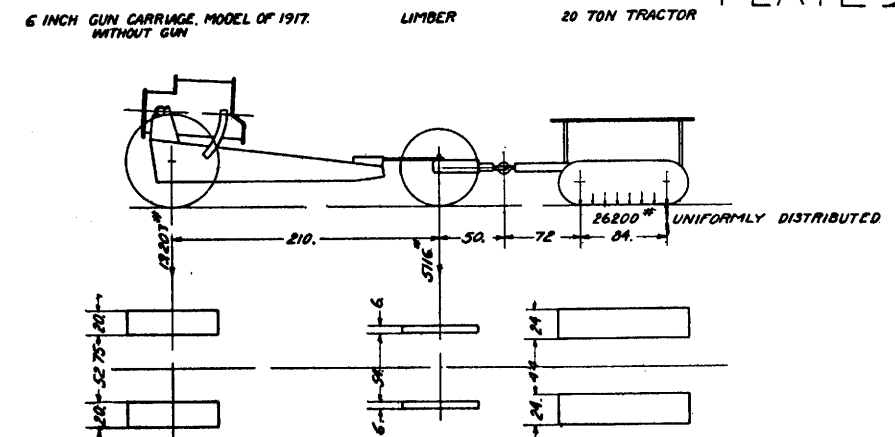
# LIST OF DRAWINGS

ASSEMBLED VIEWS	15	15R	1
SIGHT SHANK, EYE PIECE, ELBOW, AZIMUTH DETAILS	15	15R	2
ROTATING HEAD AND ELEVATION DETAILS	15	15R	3
AZIMUTH CIRCLE HOOD AND DETAILS	15	15R	4
AZIMUTH DETAILS	15	15R	5
PANORAMIC SIGHT DETAILS	15	15K	36
PANORAMIC SIGHT DETAILS	15	15K	37
PANORAMIC SIGHT DETAILS	15	15K	38
PANORAMIC SIGHT DETAILS	15	15K	39
LIST OF PARTS	15	15R	1A
AZIMUTH CIRCLE & SCREW LIST	15	15R	6

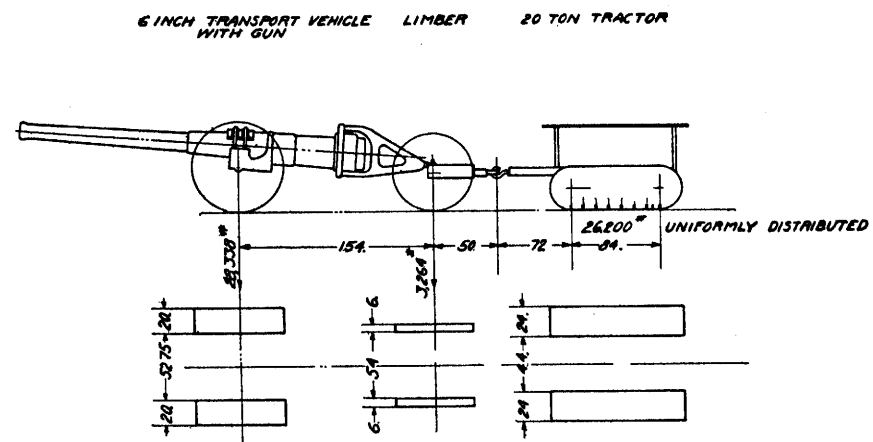
<p>DES. PER. TAINS TO</p> <p>CLASS. REV. 1 JAN 27 1917</p> <p>2 APR 18 1917</p> <p>3 SEPT 7 1917</p>	<p>REVISIONS</p>	<p>PANORAMIC SIGHT MODEL OF 1917 ASSEMBLED VIEWS</p> <p>FRANKFORD ARSENAL, U. S. A. JAN 27 1917.</p> <p> </p> <p> </p> <p> </p>
CLASS 15	DIVISION 15R	DRAWING 1
		FILE



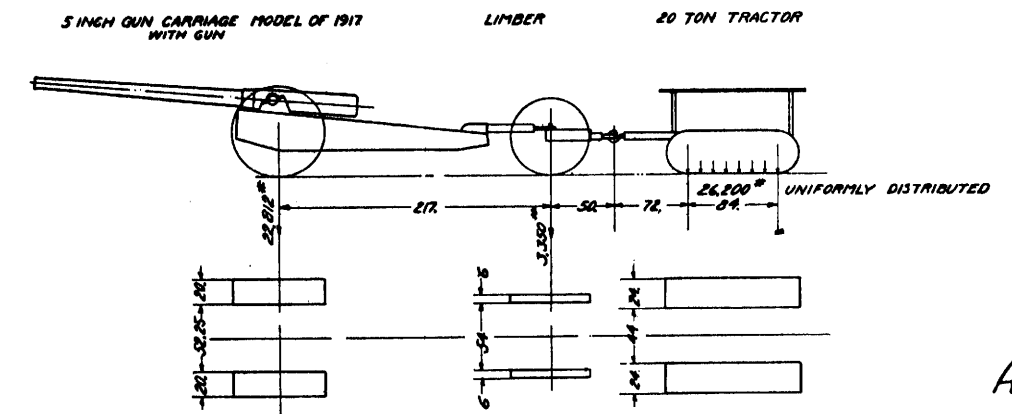
LOAD DISTRIBUTION DIAGRAM, 5.46 INCH CONVERTED SEACOAST ARTILLERY, J6-6-42, NOV 29, 1917 REVISIONS.




LOAD DISTRIBUTION DIAGRAM, 546 INCH CONVERTED SEACOAST ARTILLERY, 36-6-42, NOV. 29, 1917. REVISIONS,



LOAD DISTRIBUTION DIAGRAM, 5&6 INCH CONVERTED SEACOAST ARTILLERY, 34-6-42, NOV 29, 1917 REVISIONS.



ORG. PERTAINS TO CLASS. REV.	REVISIONS		LOAD DISTRIBUTION DIAGRAM 5&6 INCH CONVERTED SEACOAST ARTILLERY	 NOV 27 1917
		IDENTIFIED: W. H. Miller CAPTAIN, GUNNERY, BATTALIAL HQ (FORWARD)	200 600 1000 6000 APPROVED BY ORDER OF THE CHIEF OF GUNNERY W. B. Blum, MAJOR, GUNNERY DEPARTMENT, HQ	
CLASS J6		DIVISION 6	DRAWING 42	FILE